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TOPICS

TRAFFIC

OPERATIONS

PROGRAM to

INCREASE

CAPACITY and

SAFETY

KALISPELL, MONTANA



ENGINEERS · PLANNERS · SURVEYORS

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December 29, 1972

Mr. Paul DeVine, P.E.
Planning Research Director
State of Montana, Department of Highways
Helena, Montana 59601

Dear Mr. DeVine:

We are pleased to submit our TOPICS Study for the City of Kalispell, Montana, which was conducted in accordance with our contract agreement dated March 28, 1972, with the State of Montana, Department of Highways.

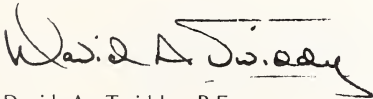
A program of projects to increase both capacity and safety on the Type II System in Kalispell is presented. The cost of the entire program is in excess of \$737,000.00. The program of recommended projects when implemented will significantly increase safety of high accident hazard locations and also provide a flexible network of streets capable of handling the traffic needs of the city.

We would like to take this opportunity to extend our appreciation for cooperation rendered by Representatives and Personnel of the Federal Highway Administration, the Traffic Design Section of the State Highway Department, the State Highway Division office in Kalispell, and the City Engineer, City Officials, and the Police Department of Kalispell.

We appreciate the opportunity allowing us to conduct this TOPICS Study.

Very truly yours,

VTN INC.



David A. Twiddy, P.E.
Vice President

CITY OF KALISPELL

PLAN FOR AREAWIDE TRAFFIC OPERATION IMPROVEMENTS

**IN COOPERATION WITH
MONTANA DEPARTMENT OF HIGHWAYS
PLANNING RESEARCH BUREAU
AND
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION**

NOVEMBER 1972

Prepared By:

VTN, Inc. Helena, Montana

The opinions, findings, and conclusions expressed in this publication are those of the authors and not necessarily those of the Federal Highway Administration.



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C O N T E N T S

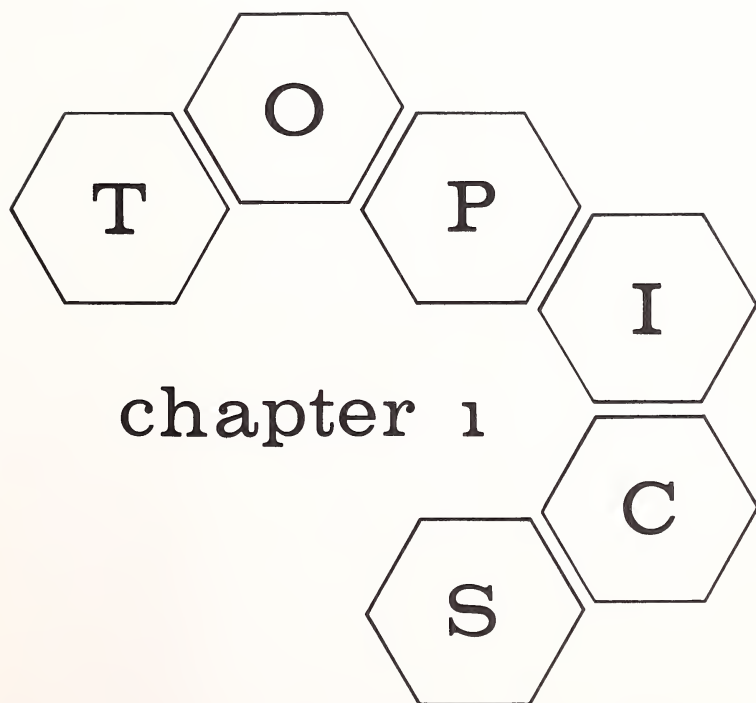
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CHAPTER I

BACKGROUND AND SUMMARY OF FINDINGS

1. Introduction

Within the context of the TOPICS Program the purpose of this report is to identify Traffic Improvement Projects within the Kalispell Urban Area and to establish an Implementation Program for the recommended improvements.

The TOPICS Program as outlined in Policy and Procedure Memorandum 21-18 is a Federal Urban Traffic Operations Program to increase the capacity and safety over a network of arterial and other major streets in an urban area. An agency shall have a continuing program within the designated Federal Urban Area Boundaries which shall consist of making traffic operation improvements on a systematic basis in accordance with an Areawide Plan. Since TOPICS does not contemplate major construction or reconstruction, but is intended to maximize the efficiency and to improve the level of service of the present street system, TOPICS Projects are normally composed of miscellaneous items of work which generally are confined to the existing right-of-way and that are considered minor items on regular urban highway construction projects.

This study is intended to provide a base for selecting TOPICS Improvements. It focuses on short-range improvements that possibly can be constructed within the next five years during which transportation plans and goals are being formulated, developed, financed and constructed. The TOPICS Program should complement these long range planning processes.

Several potential Traffic Improvement Projects have been identified, and it is intended that the analysis of these problems will permit the development of solutions with TOPICS support, in some cases, with local or other funding. The listing of potential improvements does not represent a course of action; instead, it proposes solutions which merit consideration.

Therefore, the Areawide TOPICS Plan contained herein makes recommendations within the scope and in the spirit of the TOPICS concept.

2. Study Area and Existing Transportation Systems

Kalispell is located in the Northwesterly portion of Montana at the westerly foot of the Rocky Mountains in the Flathead Valley, lying 9 miles north of Flathead Lake, 30 miles west of Glacier National Park, and 116 miles north of the City of

Missoula, the largest City in Western Montana. The Kalispell Area's economy has consisted primarily of agricultural and forestry related industries. Because of its location to nearby Glacier National Park, Flathead Lake, and Big Mountain Ski Area, Kalispell is becoming a tourist and retirement center.

Two major State Highways serve and traverse the City of Kalispell: U.S. 93 from Missoula to Whitefish and ultimately to Jasper and Banff National Parks in Alberta, and U.S. 2 from Idaho Panhandle and Libby to Glacier National Park and points East. Both of these highways are on the Federal Aid Primary System. See Exhibit 1.

Kalispell is served by the Burlington Northern Railroad which crosses the center of the City in an east-west direction. At the present time the Burlington Northern serves Kalispell with freight service only. The main line of the Burlington Northern Railroad is located 15 miles to the north of Kalispell at Whitefish and offers daily passenger service to the East and West via AMTRACK.

The City operates an airport south of Kalispell which offers small planes for special charter and air taxi services. The Glacier Park International Airport which serves the Cities of Kalispell, Whitefish, and Columbus Falls, is located on LaSalle Road 11 miles northeast of Kalispell which lies outside the urban area. This airport is the terminal for Hughes Air West Airlines and Glacier View Skyways. Access to these airports from the general vicinity of the CBD is served very well by U.S. 93 and FAS 503 to the former, and U.S. 2 and LaSalle Road (FAS 206) to the latter. No projects are contemplated in the Areawide TOPICS Plan which would provide more adequate or convenient access to either airport than that which presently exists.

The Intermountain Transportation Company offers a daily bus schedule to Missoula, Butte, Spokane, Great Falls and connecting points. The bus depot is located on 1st Street West in the Kalispell CBD Area.

Presently, the City does not have a local public transit system, and is not contemplating any mass transit service in the foreseeable future. Consequently, no coordination was required with any transit operating authority during the course of this study.

The Kalispell Area has not undertaken a Regional Transportation Study and does not have a continuing comprehensive transportation planning process.

3. Growth Trends

During the 1960-1970 period, the growth rate of the City of Kalispell was approximately the same as the State as a whole, but considerably less than the Planning Area, (as defined in the Comprehensive Development Plan) and Flathead County.

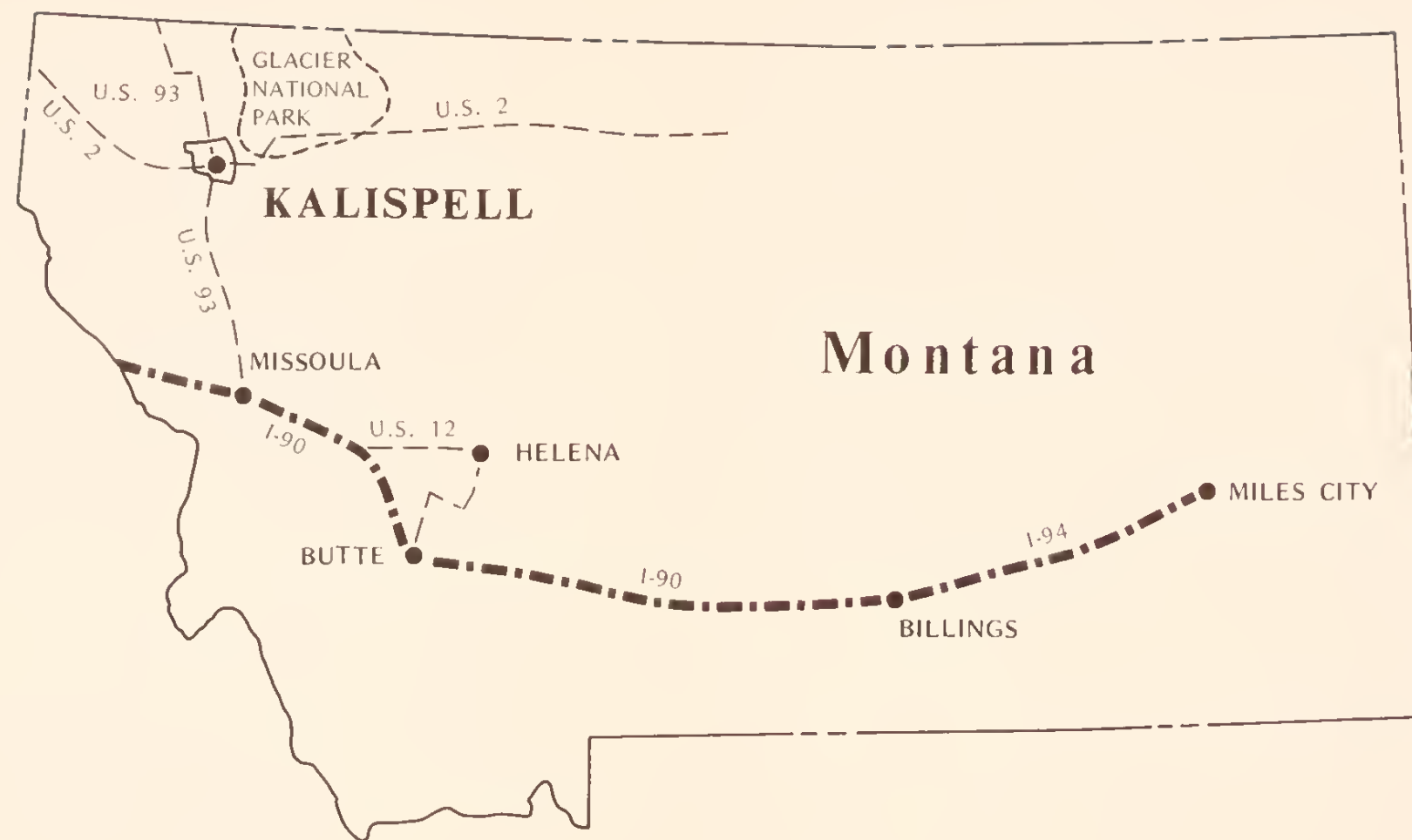


EXHIBIT 1
VICINITY MAP

The Planning Area is comprised of 53,000 acres; whereas the City of Kalispell is 1945 acres and the Urban Area is 5500 acres. On the basis of land use projections, the majority of the projected population growth will occur within the Urban Area Boundary, but outside the existing City Limits.

As outlined in the Comprehensive Development Plan, the past and projected population growths are as shown on Exhibit 2. The Comprehensive Plan indicates that employment should increase by 25% over the next 15 years.

EXHIBIT 2

POPULATION TRENDS AND PROJECTIONS 1950 TO 1985

	City of Kalispell	Planning Area	Flathead County	Montana State
1950	9,737 (0.4)	-- (--)	31,495 (0.5)	591,024 (1.4)
1960	10,151 (0.4)	13,320 (1.6)	32,965 (2.0)	674,767 (0.3)
1970	10,526 (0.4)	15,431 (1.5)	39,460 (1.8)	694,409 (--)
1975	10,737 (0.7)	16,600 (1.7)	43,010 (2.0)	-- (--)
1985	11,470*	19,600	52,510	--

*Assuming Very Few Annexations

(x.x) % Average Annualized Growth Rate

4. Study Methodology

The initial task was the review of the existing Federal Aid System Streets and the City Arterial Streets System as defined in the Comprehensive Development Plan. From this review coupled with meetings of City, County, State and FHWA Personnel, a tentative TOPICS System was developed for study.

Following this stage a basic compilation (see Chapter II) of all available traffic data was undertaken and discussions held with local agencies to obtain an indication of trouble spots. Based upon actual field observations, traffic count data, turning movement counts, accident rates, observed restricted traffic flows and agency staff inputs, a potential TOPICS Project List was compiled. The potential TOPICS Project List was then re-examined to determine those projects that would actually warrant justification for implementation under the TOPICS Program. This preliminary list of potential improvements was reviewed, revised and approved by the City, County, State, and FHWA Personnel.

Finally, these problem locations were studied to determine improvement possibilities, cost, and effect upon the street network. The projects were then arrayed based upon a cost-effectiveness ratio incorporating deficiencies such as capacity, number of accidents, number of conflict points, travel time, route continuity, pedestrian activity, and geometric configuration as related to the average daily traffic and the cost of the improvement. (See Chapter III.)

Projects which appear to be the most critical and can be fully justified are presented in Project Planning Form in Chapter IV. Projects which should be considered for implementation, but are not necessarily justified at this time or may be outside the scope of the TOPICS Program, are described in a modified format contained in Exhibit 17, Chapter III.

5. Evaluation

During the continuing phase, certain significant, completed TOPICS Projects will be selected for evaluation. It is suggested that the standard "before and after" study which compares changes in travel delay, accident frequency, etc., be utilized.

6. Technical Capabilities

With a slight change of data collection formats and priorities, the City of Kalispell, in cooperation with the Montana Department of Highways, is capable of developing a continuing traffic operations program. The Engineering Department is composed of a City Engineer, and one assistant. At the present time two electrical firms are utilized for maintenance of existing traffic signal operations.

It appears that the City is adequately staffed to insure proper maintenance of the existing and future traffic signal installations.

7. Laws and Ordinances

The "City of Kalispell Traffic Code", Chapter 17 of the Kalispell Code, specifies Vehicle Standard, Rules of the Road, and Standards for Traffic Signing, Traffic Markings, and Signalization. It applies to all types of traffic, and also specifies the duties and authority of the Police Department and City Engineer. This code is not in full conformance with National Standards and has not been updated to conform with the 1971 Manual on Uniform Traffic Control Devices.

The zoning ordinance R01947, with revisions, applies to the city zoning districts and required minimum setback for buildings along arterial streets. Section 2441 of the City Ordinance specifies the curb cut regulations, and Off-street Parking Ordinance No. 793 (passed Jan. 1, 1972) applies to off-street parking requirements in commercial areas, except for CBD.

Generally the existing codes and ordinances are quite comprehensive and the basic enforcement appears to be good. It is recommended however, that the necessary revisions be made to bring them into conformance with the 1971 Manual on Uniform Traffic Control Devices, and the latest copy of the Motor Vehicle Code of the State of Montana.

8. Comprehensive Development Plan

In June, 1971, the Flathead-Kalispell City-County Planning Board completed a Comprehensive Development Plan, which, at this time, has not been adopted by the appropriate City and County Agencies. The "Plan" establishes general guidelines through 1985 for the desirable development of the Kalispell Region. The transportation and circulation system is an integral part of this regional planning endeavor. Additional information on the "Plan" as it relates to the TOPICS Program is included in Chapter II.

9. Special CBD Development Plan Study

The TOPICS Study directs attention to exploring a one-way couplet for 1st Avenue East and 1st Avenue West as a means to reducing congestion on Main Street, the heart of the retail core in the Central Business District.

At the present time, the City-County Planning Board is exploring the possibilities of a mall or semi-mall development on Main Street in the Central Business District, hereinafter referred to as the CBD Development Plan Study. If the signals are properly programmed, a one-way couplet could smooth traffic flow through the Central Business District. Main Street South at the Courthouse could be designed to provide a smooth transition from a two-way street to a one-way street system. At the north end of the CBD, right of way should be purchased on the west side of Main Street to provide a smooth transition from 1st Avenue West into Main Street.

During the course of the CBD Development Plan Study, special attention and study should be devoted to the impact of a mall development on traffic flow, circulation, safety, and capacity. Other than including the 1st Avenue West and 1st Avenue East one-way couplet in the TOPICS Implementation Program, providing a mall or semi-mall is approved by the City, no further study or mention is given to this project during the course of the TOPICS Study. It is our recommendation that if the City decides to improve the retail core with a mall, that the TOPICS Implementation Program be changed at that time to reflect the 1st Avenue East - 1st Avenue West one-way couplet project including the proper construction of end conditions as described above.

10. Study Findings

It is our recommendation that the Recommended TOPICS System be approved by the City and County as the Final TOPICS System, provided that the secondary arterial streets remain on the circulation system of the Comprehensive Development Plan. If the arterial network were developed properly to encourage the use of secondary arterials, it is believed that proper traffic diversion would occur so that no one arterial street would carry the majority of traffic. The answer to Kalispell's circulation problem is not to divert all intracity travel to U.S. 2 and U.S. 93 nor to the residential streets, but to develop secondary arterial corridors so that traffic may be controlled. Thus, maximum safety and capacity of the street system will be realized.

The Recommended TOPICS System is shown on Exhibit 16 in Chapter III and the mileage is summarized on Exhibit 15 in Chapter III. The approved TOPICS System as adopted by the City and County is shown on Exhibit 3 in this chapter.

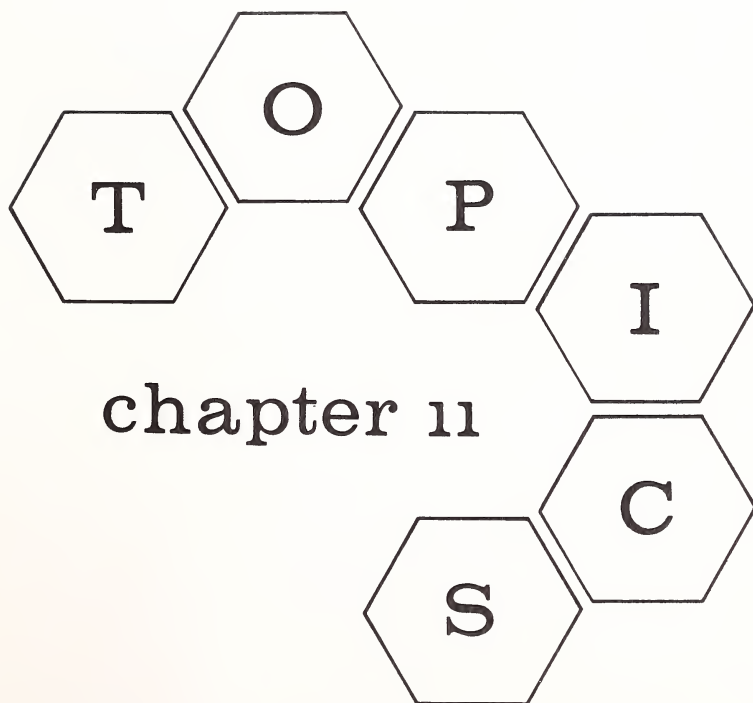
The findings of this study reveal the following projects under Stage I (See Exhibit 18) would be recommended for early implementation under the TOPICS Program:

1. Signalization at Meridian Road and Idaho Street (U.S. 2)
2. The Central Business District Signal System
3. U.S. 2 and U.S. 93 channelization and new signal controller
4. Center Street widening between Main Street and 1st Avenue East
5. U.S. 93 access channelization and realign roadways
6. U.S. 2 and LaSalle Road install median, modify flasher and restripe

The remaining projects are grouped into 3 stages for funding and implementation. Also included in this report are projects that are not necessarily justified at this time under the TOPICS Program or projects of such a size, either too large or too small, that the City should find other sources of funding in order to implement them. These projects are included in Chapter III of this report and summarized in Exhibit 18.

EXHIBIT 3

Following City approval, the approved TOPICS System (color coded) Map will be inserted as Exhibit 3.



chapter 11

CHAPTER II

STUDY INPUTS AND ANALYSIS

1. Circulation Analysis

a. Land Use

The Land Use Plans shown on Exhibit 4 and 5 as proposed and shown in the Comprehensive Development Plan indicates the placement of commercial-industrial uses and residential uses to 1985.

Compared to existing land uses, the plan locates a heavier or new concentration of light industrial sites south of the city along the B.N.R.R. Tracks, and adjacent to the Frontage Road and U.S. 93, and adjacent to U.S. 93 south of the airport; west of the City south of U.S. 2; and northeast of the City north of U.S. 93. Heavy industrial sites have been proposed in the Evergreen Area and at the West City Limits.

The land use plan calls for a higher density residential development adjacent to the CBD and for little change in residential character throughout the rest of the City. The primary residential growth should occur outside the City Limits, but within the Urban Area Boundary. New medium density residential areas are proposed on Evergreen Drive, west of U.S. 93; along U.S. 2 and LaSalle Road, northeast of the City and along Meridian Road, south of U.S. 2. A heavier concentration of urban or suburban density residential areas is proposed to the north of the City along the Meridian Road and U.S. 93 corridor, to the east of the City between Woodland Drive, Conrad Drive, Willow Glen Drive, and U.S. 93 and to the northeast of U.S. 2 between Helena Flats Road and LaSalle Road.

b. Major Trip Generators

Other proposed developments, which are major traffic generators, include a new hospital and doctor's clinic to the east of U.S. 93 in the vicinity of the Meridian Road Intersection and the relocation of Flathead Community College from the Central Business District to the vicinity of the U.S. 93-Meridian Road Intersection. A recently completed development which is a major traffic generator, is a new shopping complex in the southeast quadrant of the U.S. 2 - Meridian Road Intersection.

LEGEND

-  OTHER COMMERCIAL
-  HEAVY INDUSTRY
-  LIGHT INDUSTRY

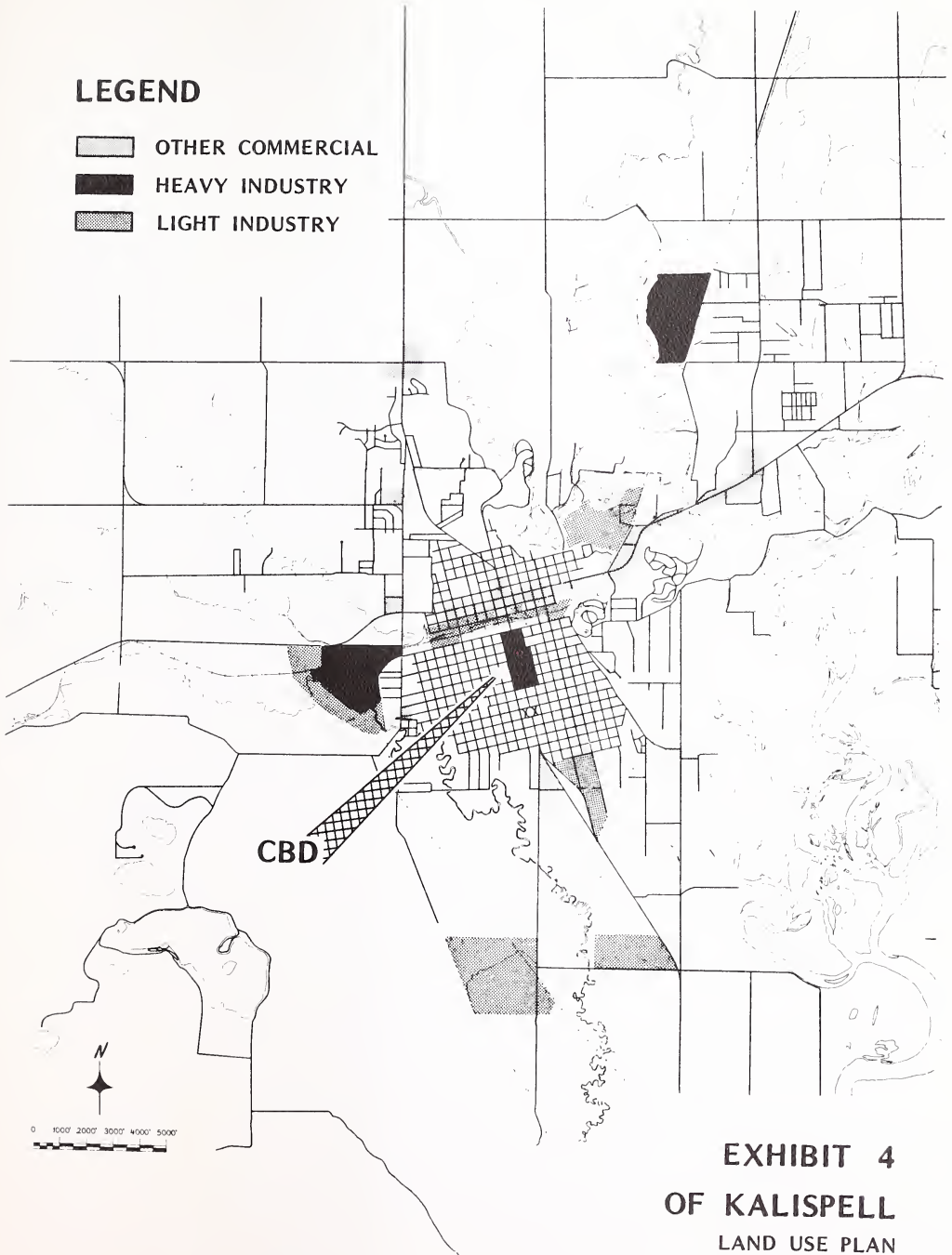


EXHIBIT 4
OF KALISPELL
LAND USE PLAN

LEGEND

DENSITY



SUBURBAN



URBAN



MEDIUM



HIGH

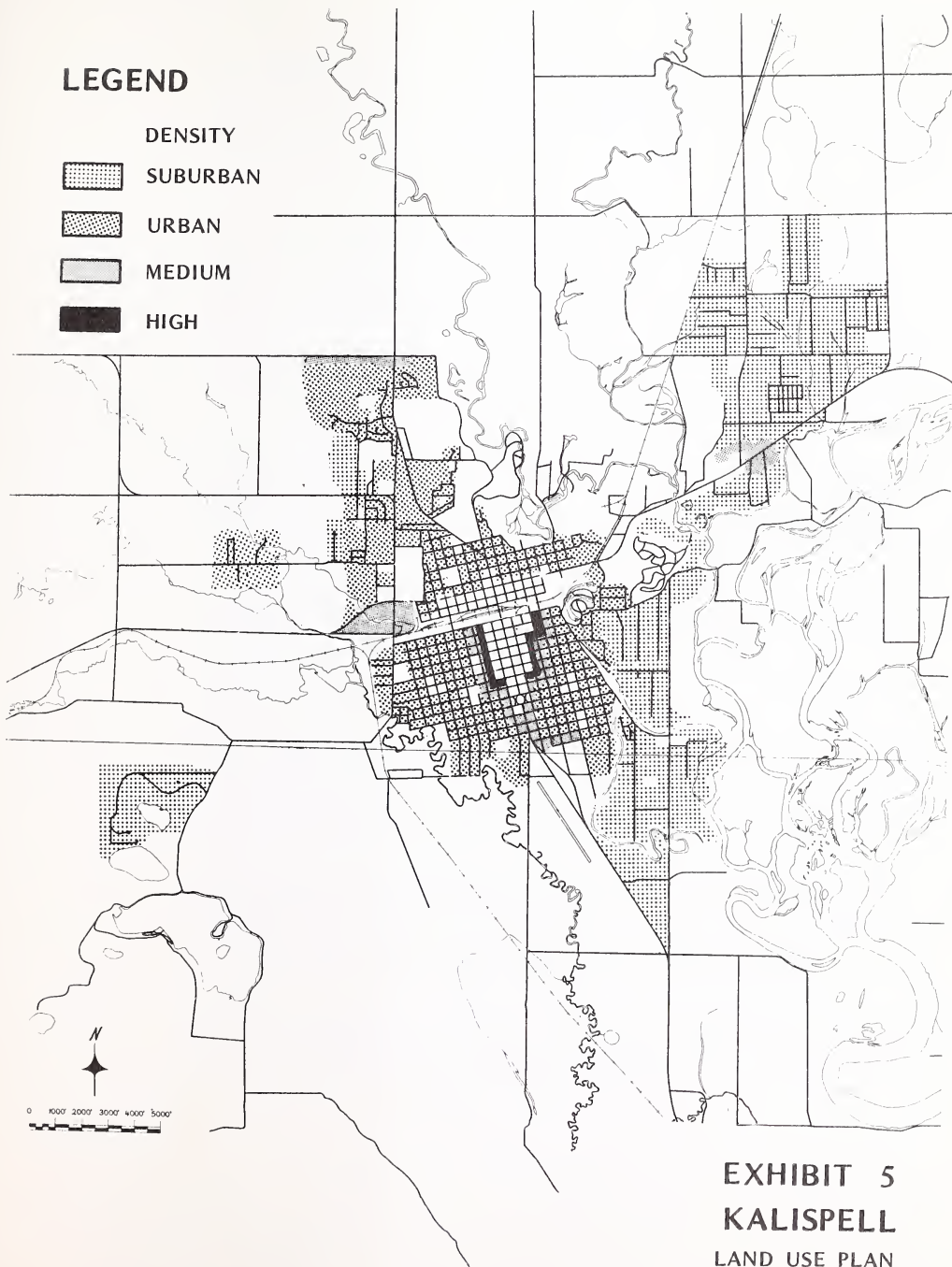


EXHIBIT 5
KALISPELL
LAND USE PLAN

We have estimated at the present time that 8800 two way trips are generated from the residential area bounded by Main Street, 11th Street, Meridian Road, and Center Street and that 9500 two way trips are generated from the residential area bounded by Main Street, 15th Street, Woodland Avenue, and Center Street.

c. Traffic Volume Counts

The 1972 Annual Average Daily Traffic (AADT) Counts for the TOPICS System, except for the CBD, are indicated on Exhibit 6. The CBD (AADT's) are included with the CBD Project Planning Report in Chapter IV of this report. The AADT's were derived from counts collected by the State in 1970 and from counts collected by VTN in the summer and fall of this year. All counts were corrected for seasonal and yearly variations in traffic flows based upon available State counts on State Routes in Western Montana. In some cases, especially U.S. 2 to the east of U.S. 93, traffic growth has not occurred over the last two years.

Upon analysis of past count information, the primary growth in Traffic Volumes has occurred on Meridian Road to the north of U.S. 2, Idaho Street (U.S. 2) between Meridian Road and Main Street (U.S. 93) and, to a lesser extent, the East-West Traffic Volumes in the CBD. No past traffic counts are available on the Primary Type II System, so no comparisons can be made.

It appears that the traffic growth is representative of some of the recent land use changes outlined in the Comprehensive Development Plan.

d. Origin and Destination Study

The Montana Department of Highways conducted an Origin and Destination Study in the Kalispell Area in June of 1970. The data was published in 1972. Outbound motorists were interviewed at five stations located on the principal highways near the urban limits. A summary of the percentage of through trips by Station Location is shown on Exhibit 7.

Upon analysis of the data generated from Exhibit 7, approximately 12% of the trips utilizing the Intersection of Idaho Street and Main Street are external to external or State oriented trips. The current approach volume at this intersection is 23,000 AADT which means 20,000 trips are intracity trips.

Since U.S. 2 and U.S. 93 carry the highest volume of any streets in Kalispell, and the volume/capacity (V/C) ratio at the intersection approaches 1.01, the City must develop other arterial streets including East-West Arterial Streets in order to adequately carry the intracity trips.

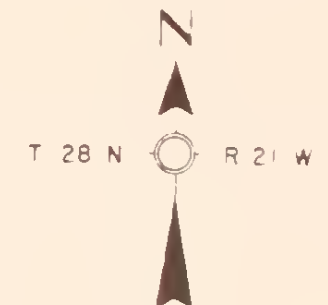
CITY PLAT KALISPELL FLATHEAD COUNTY MONTANA

1970 CENSUS 10,526

SCALE IN FEET



REVISED DEC. 31, 1971



LEGEND

AVERAGE ANNUAL DAILY TRAFFIC

1,000 - 3,000

3,000 - 6,000

6,000 - 10,000

10,000 - 12,000

12,000 - 15,000

EXHIBIT 6

AVERAGE ANNUAL
DAILY TRAFFIC COUNTS

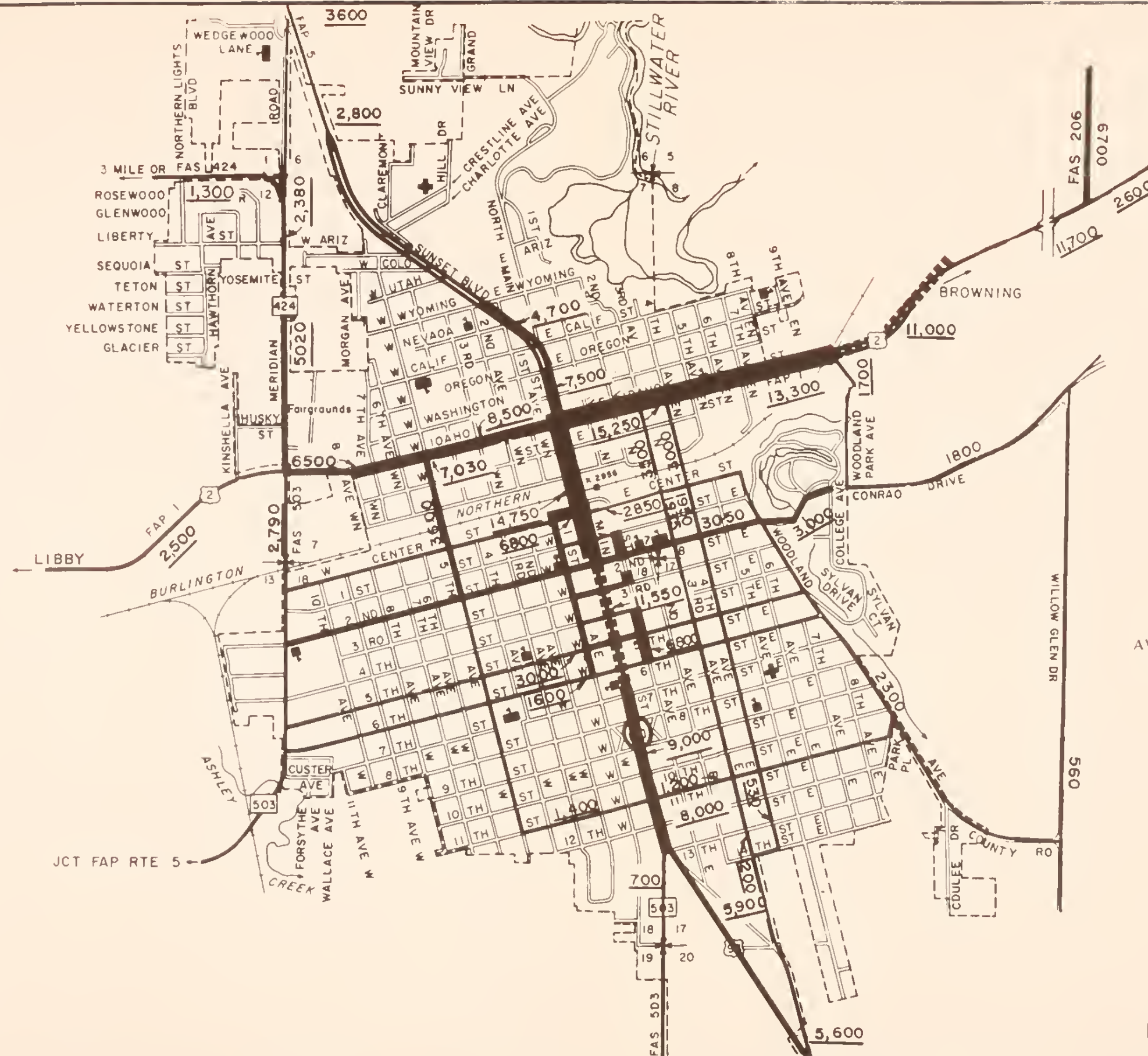


EXHIBIT 7

PERCENTAGE OF THROUGH TRIPS BY EXTERNAL STATION LOCATION

1970 Traffic Count	To From	U.S.2 East	U.S.2 West	U.S.93 North	U.S.93 South	FAS424 North	Total Through
12,930	U.S.2 East	--	5.2	1.6	7.8	0.3	14.9
2,440	U.S. 2 West	27.6	--	5.9	8.3	0.3	42.1
3,640	U.S.93 North	5.5	4.0	--	12.5	NEG	22.0
5,840	U.S.93 South	17.3	3.5	7.8	--	0.5	29.1
900	FAS424 North	4.6	0.3	0.6	3.0	--	8.5

e. Purpose

Ordinarily this type of circulation analysis is not necessary for a TOPICS Study; however, it is important to this report for three reasons:

1. To ensure that any TOPICS Improvements will be coordinated with the Comprehensive Development Plan and to determine traffic growth trends in various areas of the City over the next 5 years.
2. To partially analyze the street network, to identify problem areas such as Main Street and Idaho Street, and to determine the composition of the traffic flow in order to properly analyze the cause and effect of the recommended improvements.
3. To analyze the Tentative TOPICS System for final approval.

f. Conclusions

Following are basic conclusions:

1. Traffic growth will continue to increase at an accelerated pace in the Northwest Quadrant of the City.
2. Traffic growth will start to increase in the Southern Portion of the City.
3. Traffic growth will start to increase in the Eastern Portion of the City.
4. Based upon proposed location of employment centers and residential areas, more East-West traffic will be generated.
5. Any solution to solve the East-West traffic flow problem by connecting the Residential Area east of Woodland Avenue with U.S. 2 instead of developing East-West Arterial Streets could aggravate the capacity problem at Main Street and Idaho Street.

Therefore, based upon existing trip generation rates from the Residential Area, projected land uses, and system network development, we recommend that the following projects be included in the TOPICS Implementation Program:

1. Improve the Intersection of 11th Street and Woodland Avenue by eliminating the street jog and improving the sight distance.
2. Provide a one-way couplet of 5th Street and 6th Street between Meridian Road and Woodland Avenue, or develop 6th Street as a

two-way arterial street by removing all parking where the roadway width is 30' and one side parking where the roadway width is 34'. Improve turning radius at the Intersection of Woodland Avenue and 6th Street.

3. Install a signal at the Intersection of 11th Street with Main Street (Future).
4. Install a signal or signals at the Intersection of 5th Street and/or 6th Street with Main Street.
5. Construct a new roadway from the Intersection of Conrad Drive and Woodland Park Avenue along the general alignment of College Avenue to intersect with Woodland Avenue in the vicinity of 5th and/or 6th Streets, and then remove Conrad Drive between Woodland Park Avenue and Woodland Avenue from the TOPICS System.
6. Widen Meridian Road between 3 Mile Drive and U.S. 2 by providing widened shoulders or constructing a walkway.
7. Provide one-way couplet on 3rd Avenue East and 4th Avenue East between Center Street and U.S. 2. Construct two-way connector road between 3rd and 4th South of U.S. 2.
8. Construct one-way couplet on 4th Avenue East south of 14th Street East.

Additional information and data on the above projects are found in chapters III and IV.

2. Roadway Geometric Analysis

a. Roadway Geometrics

All roadways on the Tentative TOPICS System were inventoried. The results of this inventory are shown in schematic form on Exhibit 8 and in tabular form on Exhibit 9. In most instances the basic roadway widths are adequate to handle existing and future traffic growths with the exception of the proposed East-West arterials. Unless a one-way street system such as the 5th and 6th Street proposal is implemented, parking would have to be removed on several streets. If not, the streets must be widened which constitutes major construction and is outside the scope of the TOPICS Program.

In many cases, especially outside the older more established residential community, sidewalks are not provided and there are not adequate shoulders

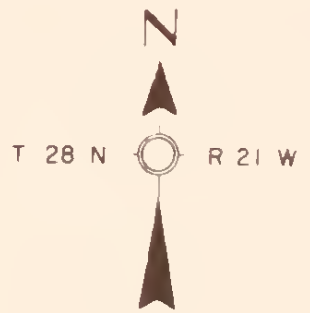
CITY PLAT KALISPELL FLATHEAD COUNTY MONTANA

1970 CENSUS 10,526

SCALE IN FEET



REVISED DEC. 31, 1971



LEGEND

20' - 29' ROADWAY WIDTH	-----
30' - 39' " "	=====
40' - 49' " "	
50' - 59' " "	—————
60' - 70' " "	=====
ROADWAY WITHOUT CURB AND GUTTER	-----
FUTURE ROADWAY EXTENTION	

EXHIBIT 8

ROADWAY GEOMETRIC DATA

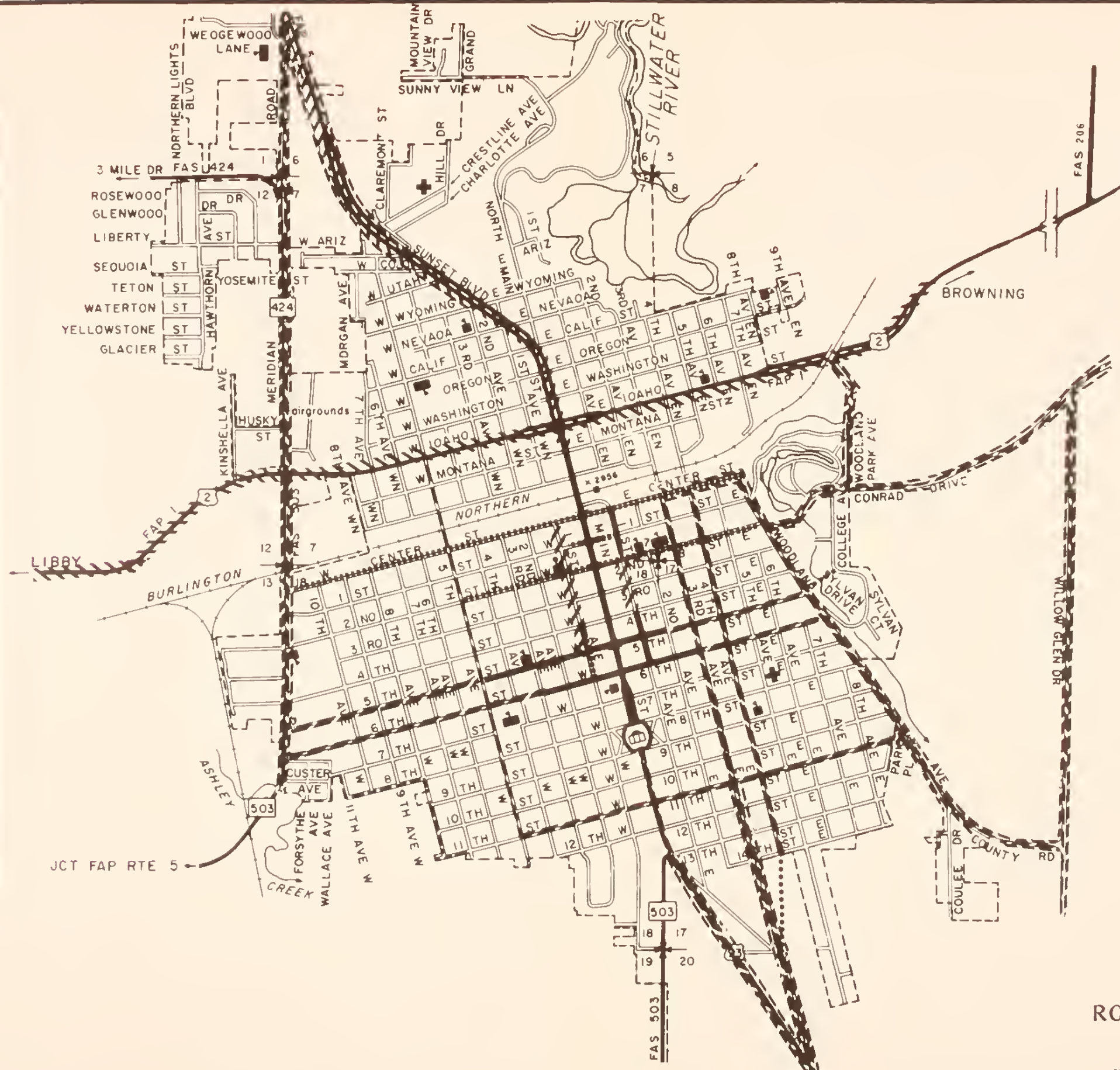


EXHIBIT 9

SEGMENT GEOMETRIC DATA

Street Name	Segment		No. Of Ln	Ln W	Rd W	R O W	Pvmt Type	Terrain	Park'	Curb'	Walk'	Area Development				St. Oper;	Lgth City MLS Class	Fed. Class	Divided Hwy	
	From	To										Res.	Com.	Ind.	Vac.				Raised Median	T.W L.T
Idaho St. U.S.2	East Urban Bndry	West Urban Bndry	4	12	60	74'	A/C	Level	16'	1.65	5'	5%	85%		10%		4.77 Prim.	FAP		.13*
Center St.	Woodland Ave.	First Ave. E.	2	13	32	60'	A/C	Level	16'	.30	9'	65%		35%			.35 Col.			
	First Ave. E.	Main Street	2	14	37	60'	A/C	Level	8'	.14	9'		50%	50%			.07 Col.			
	Main Street	Meridian Rd.	2	13	34	60'	A/C	Level	16'	.35	4'	10%		90%			.79 Col.			
Conrad Drive	Willow Glen Dr.	Woodland Dr.	2	10	20	66'	A/C	Rolling	-	-	-	50%			50%		.30 Col			
3 Mile Drive	Meridian Dr.	Urban Area Bdry	2	12	24	60'	A/C	Rolling	-	-	-	50%			50%		.24 Col.	FAS		
Second Street	Woodland Ave.	Fifth Ave. E.	2	14	30	60'	A/C	Level	8'	.18	4'	100%					.09 Sec.			
	Fifth Ave. E.	Fifth Ave. W.	2	14	44	60'	A/C	Level	8'	.33	4/8'	25%	75%				.71 Sec.			
	Fifth Ave. W	Meridian Dr.	2	14	30	60'	A/C	Level	8'	.25	4'	100%					.47 Sec.			
Fifth Street	Woodland Ave.	Second Ave. E.	2	15	34	66'	A/C	Level	-	.57	4'	75%	25%				.37 Loc.			
	Second Ave. E.	First Ave. W.	2	19	54	66'	A/C	Level	16'	.34	6'	25%	75%				.22 Loc.			
	First Ave. W.	Tenth Ave. W.	2	9	34	66'	A/C	Level	16'	1.02	4'	100%					.61 Col.			
	Tenth Ave. W	Meridian Rd.	2	11	30	66'	A/C	Level	16'	.36	-	100%					.20 Col.			
Sixth Street	Woodland Ave.	Third Ave. W.	2	9	30	66'	A/C	Level	16'	1.22	4'	100%					.76 Sec.			
	180'W/o 5th Ave.W.	180'W/o 5th Ave. W.	2	19	54	66'	A/C	Level	16'	.28	4'	100%					.17 "			
	180'W/o 5th Ave.W.	Meridian Rd.	2	9	34	66'	A/C	Level	16'	.91	4'	100%					.51 "			
Woodland Ave.	Center St.	Willow Glenn	2	12	32	70	A/C	Level	8'	.34	4'	50%			50%		1.17 Col.			
Fourth Ave. East	U.S. No. 2 - Idaho	Fourteenth St. E.	1	14	30	60	A/C	Level	16'	1.48	4'	75%	25%				1.21 Col.		(one-way N/Bound)	
Third Ave. East	U.S. No. 2 - Idaho	Eleventh St. W.	1	14	30	60	A/C	Level	16'	1.48	4'	75%	25%				1.00 Col.		(one-way S/Bound)	
	Eleventh St. E.	U.S. Hwy 93	2	14	30	60	A/C	Level	16'			10%	40%		50%		.78 Col.			

*Intersection U.S. 2

SEGMENT GEOMETRIC DATA

Street Name	Segment		No. Of Ln	Ln W	Rd W	R O W	Pvmt Type	Terrain	Park'	Curb'	Walk'	Area Development				St. Oper.	Lgth City MLS Class	Fed. Class	Divided Hwy	
												Res.	Com.	Ind.	Vac.				Raised Median	T.W. L.T.
	From	To																		
First Ave. East	Center St.	First St. East	2	17	60	80	A/C	Level	16'	.23	10'	100%					.14	Col.		
	First St. E.	Sixth St. East	2	17	55/ 64	80	A/C	Level	8'/20'	.45	10'	100%					.28	Col.		
U.S. Hwy 93 Sunset Blvd. & Main Street	Urban Boundary	Montana	4	12	36/ 70	90	A/C	Level	8'			10%	15%		75%		1.92	Prim.	FAP	
Main Street	Montana	Ninth	4	12	58	90	A/C	Level	8'	1.22	10'	5%	95%				.79	Prim.	FAP	
	Ninth	Thirteenth	2	12	60	90	A/C	Level	8'	.96	4'/-	95%	5%				.28	Prim.	FAP	
	Street	Urban Boundary	2	12	36	90	A/C	Level	16'	.23	6'/-	30%	50%		20%			Prim.	FAP	
First Ave. W.	Center Street	Fourth St. W.	2	12	60	80	A/C	Level	40'	.45	10'		100%				.27	Col.		
	Fourth St. West	Sixth St. West	2	12	42	80	A/C	Level	16'	.23	4'	50%	50%				.14	Col.		
Fifth Ave. West	West Idaho	Eleventh St. W.	2	12	30	60	A/C	Level	-	1.48	4'	98%	2%				1.01	Col.		
Meridian Rd.	U.S. Hwy 93	3 Mile Drive	2	10	20	60	A/C	Level	-	-	1-2'	30%			70%		.42	Col.	FAS	
	3 Mile Drive	Urban Boundary	2	12	24	60	A/C	Level	-	-	6'	40%			60%		1.72	Col.	FAS	
Woodland Park Ave.	Idaho St. (U.S.2)	Conrad Drive	2	12	24	66	A/C	Level	-	-	-	30%	(30% Park)		40%		.37	Local		
Airport Rd.	Thirteenth St.	Urban Boundary	2	12	24	50	A/C	Level		-	-	5%	20%		75%		.92	Col.	FAS	
Willow Glen Dr.	Conrad Dr.	U.S. No. 93	2	12	24	60'	A/C	Rolling		-	-	70%			30%		2.22	Prim.	FAP	
LaSalle Rd.	U.S. No. 2	Urban Boundary	4	12	48	80'	A/C	Rolling				40%	40%		20%		1.7	Prim.	FAP	

SEGMENT GEOMETRIC DATA

Street Name	Segment		No. Of Ln	Ln W	Rd W	R O W	Pvmt Type	Terrain	Park'	Curb'	Walk'	Area Development				St. Oper.	Lgth City MLS Class	Fed. Class	Divided Hwy	
	From	To										Res.	Com.	Ind.	Vac.				Raised Median	T.W. L.T.
1st Street	1st Ave. E.	1st Ave. W.	2	12	44	60	A/C	Level	16'	0.30	8'	100%					0.15 Loc.			
3rd Street	1st Ave. E	1st Ave. W	2	12	44	60	A/C	Level	16'	0.30	8'	100%					0.15 Loc.			
4th Street	1st Ave. E.	1st Ave. W.	2	12	44	60	A/C	Level	16'	0.30	8'	100%					0.15 Loc.			
14th Street	4th St. E.	3rd St. E.	2	12	30	60	A/C	Level	16'	0.14	-	100%					0.07 Loc.			
11th Street	Woodland Ave.	5th Ave. E.	2	9	34	66'	A/C	Level	16'	-	-	100%					0.28 Col.			
	Fifth Ave. E.	1st Ave. E.	2	9	30	66'	A/C	Level	16'	-	-	100%					0.28 Col.			
	1st Ave. E.	5th Ave. W.	2	9	34	66'	A/C	Level	16'	-	-	100%					0.43 Col.			

Parking: Parallel 8' (one side)
Parallel 16' (both sides)

Parking: Parallel 8' (one side) Angle 20' (one side)
Parallel 16' (both sides) Angle 40' (both sides)

for the pedestrians. With certain exceptions, horizontal and vertical sight distances on most streets are adequate for 85 percentile traffic speed.

b. Capacity Constraints

A capacity analysis of the intersections revealed that there are only two intersections within the City currently operating with a Volume/Capacity ratio approaching or greater than 1.0.

1. Main Street and Center Street - $V/C = 1.35$ the critical movements are SB and WB and the EB left turn movement.
2. Main Street and Idaho Street - $V/C = 0.80$ the critical movements are the WB left turn, the NB through, and the EB through.

c. Conclusions

Based upon poor roadway geometrics and capacity constraints, we recommend that the following projects be included in the TOPICS Implementation Program:

Projects Based Upon Roadway Geometrics

1. Widen Center Street between Main Street and 1st Street East.
2. Improve all intersections and access on U.S. 93 between FAS 503 and Frontage Road (south end).
3. Improve 3rd Avenue East and Frontage Road Intersection.
4. Increase turning radius at 6th Street and Woodland Avenue Intersection.
5. Improve 11th Street and Woodland Avenue Intersection by eliminating street jog and alleviating a sight distance problem.
6. Improve Meridian Road between 3 Mile Drive and U.S. 93 to include either a walkway or widened shoulders.
7. Increase turning radius at Center Street and Meridian Road Intersection.

Projects Based Upon Capacity

1. Provide double left turn lane at Main Street and Idaho Street Intersection.

2. Widen Center Street between Main Street and 1st Avenue East.

Additional information and data on these projects are found in Chapters III and IV.

3. Accident Analysis

a. Inventory

The City, at this time, does not record accidents by location, but maintains a chronological file only based upon the investigating officers report. The City Police Department personnel retrieved the pertinent engineering information and summarized the accidents by location from June, 1970, 1971, to July, 1972. Collision diagrams were prepared for about 50% of the intersections on the TOPICS System. Accident rates were calculated for the intersections; the results of which are tabulated on Exhibit 10.

As would be expected, the highest number of accidents occur at intersections with Idaho Street (U.S. 2) and Main Street (U.S. 93).

All locations contained in Exhibit 10 were investigated to determine possible causes, except at those intersections currently being reconstructed on other projects providing other analyses, which did not suggest an improvement. If the accident rate was high or the number of accidents low (3 or less per year), the intersection was investigated, but in most instances no improvements are recommended.

b. Conclusions

The accident rates were compared to national norms as reported and synthesized by two publications of the Automotive Safety Foundation*; and after field reviewing the projects in relation to the collision diagrams, the following projects are recommended to be included in the TOPICS Implementation Program:

*Traffic Control & Roadway Elements, the Automotive Safety Foundation in cooperation with the U.S. Bureau of Public Roads, 1963.

Traffic Control & Roadway Elements, Their Relationship to Highway Safety Revised, Chapter 4, Intersections Highway Users Federation for Safety and Mobility, 1970.

EXHIBIT 10

ACCIDENT BREAKDOWN - RANK BY ACCIDENT RATE June 1970 to June 1972

Rank	Intersection	Avg. No. of Acc./Year	AADT	Acc.* Rate	Rank by No. of Acc.
1	Conrad Drive & Woodland Park Ave.	2.5	3,200	2.14	15
2	Meridian Road & Idaho St. (U.S. 2)	5.5	8,500	1.77	5
3	Center Street & 3rd Ave. E.	3	5,840	1.71	13
4	U.S. 2 & LaSalle Rd.	5.5	10,516	1.43	5
5	Main St. (U.S. 93) & Idaho St. (U.S. 2)	11	23,000	1.31	1
6	Main St. & 1st St.	7.5	15,100	1.36	4
7	Idaho Street (U.S. 2) & 3rd Ave. E.	8	17,270	1.27	3
8	Idaho Street (U.S. 2) & 5th Ave. W.	4.5	10,030	1.23	8
9	Main St. & Center St.	8.5	20,000	1.16	2
10	Main & 3rd St.	5.5	15,000	1.00	5
11	3rd Ave. E & 2nd St.	2	4,460	0.99	17
12	Main St. (U.S. 93) & 2nd St.	4	11,572	0.95	11
13	1st Ave. W. & 2nd St.	3	9,122	0.90	13
14	1st Ave. E. & 1st St.	2.5	7,469	0.92	15
15	Main St. & 4th St.	4.5	14,300	0.86	8
16	Main St. & Montana	4.5	16,000	0.77	8
17	1st Ave. W. & 1st St.	2	7,480	0.73	17
18	Center St. & 1st Ave. E.	1.5	6,000	0.68	19
19	Main St. & 2nd St.	4	17,000	0.64	11

*Accident Rate For This Analysis Is Defined As Number
Of Accidents Per Million Vehicles Per Year.

$$\text{Or Accident Rate} = \frac{(A / \text{year}) (1,000,000)}{(\text{AADT}) (365)}$$

1. Meridian Road and Idaho Street (U.S. 2)
2. LaSalle Road and Idaho Street (U.S. 2)
3. Main Street (U.S. 93) and Idaho Street (U.S. 2)
4. Main Street (U.S. 93) and Center Street

4. Traffic Control Device Analysis

a. Inventory

All pertinent regulatory traffic control devices were inventoried. The results of this inventory which includes all traffic signals and intersection regulatory signs are summarized on Exhibits 11 and 12.

Other items such as regulatory signs, warning signs, guide signs, illumination, and railroad crossings were noted where deficient, and are utilized only for specific TOPICS Projects recommended elsewhere in this report or for general recommendations included in this section.

b. Traffic Signals

Following the completion of the current reconstruction contract, the only traffic signals in the City that will not conform to the Manual on Uniform Traffic Control Devices (MUTCD) for both pedestrian and vehicular displays are those on 1st Avenue East and 1st Avenue West in the CBD. Interconnect cable is provided for the entire signal system including those signals on Idaho Street. One flasher at 5th Avenue West at Flathead High School does not conform to the MUTCD.

c. Illumination

Street illumination within the City is generally poor on all the streets on the Federal Aid System. Some of the streets in the CBD and isolated segments of other streets are illuminated with mercury vapor fixtures to conform to ASA - IES design levels. Majority of streets are either illuminated with incandescent fixtures or have no lighting at all.

d. Railroad Crossings

The Burlington Northern Railroad maintains 2 trackage segments within the City of Kalispell (see figure), a branch line running generally east-west through the City, and a spur line which runs south from Kalispell to Somers. They have no plans for expansion or abandonment of any trackage within this area. Their yard facilities effectively partition the northern part of the City from the

CITY PLAT
KALISPELL
FLATHEAD COUNTY
MONTANA

1970 CENSUS 10,526

SCALE IN FEET



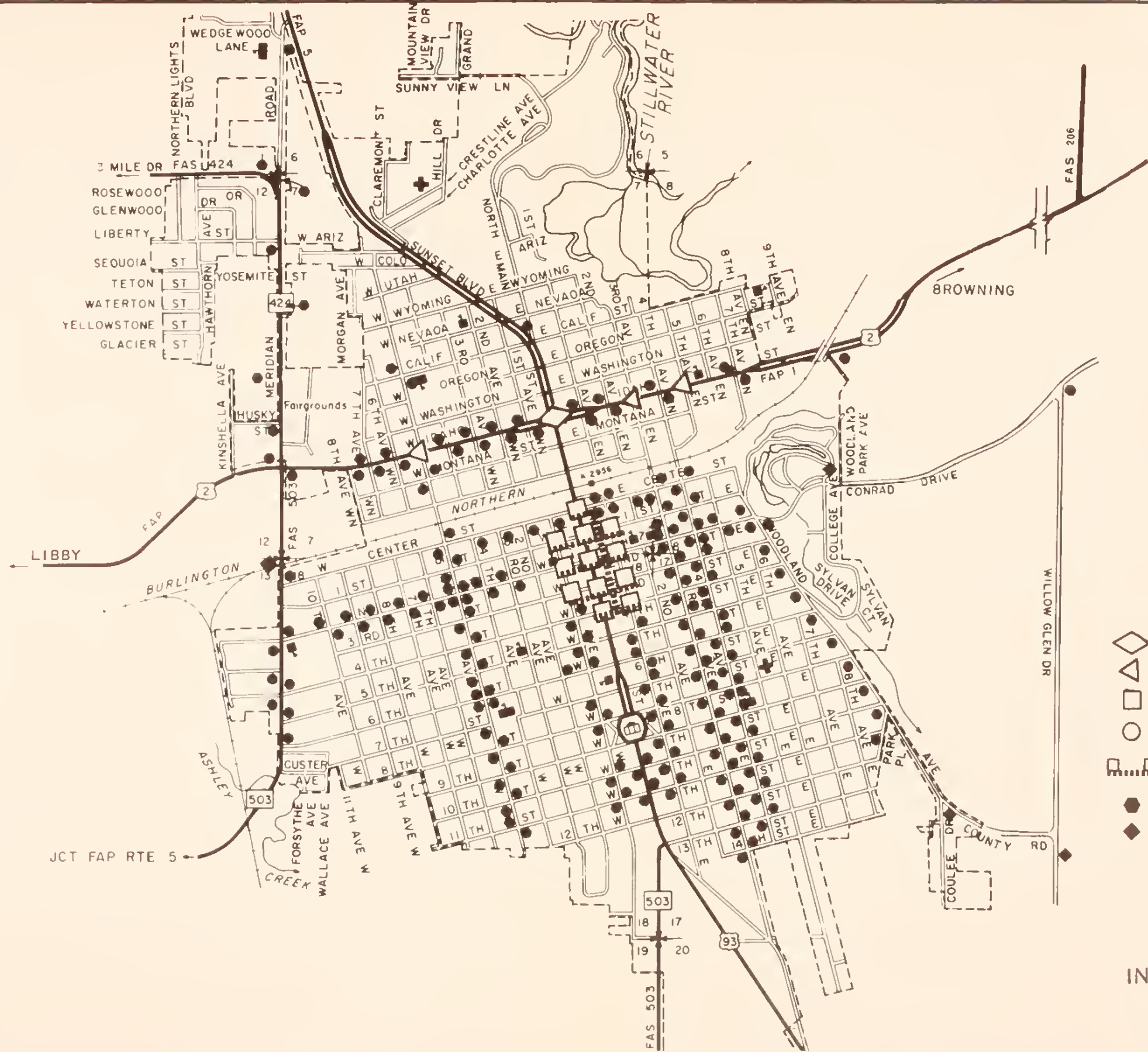
REVISED DEC. 31, 1971



LEGEND

- FULLY ACTUATED
- SEMI ACTUATED
- FIXED TIME
- FLASHER
- INTERCONNECTED SIGNALS
- STOP SIGN
- YIELD SIGN

EXHIBIT 11
INVENTORY OF TRAFFIC
CONTROL DEVICES



CITY PLAT KALISPELL FLATHEAD COUNTY MONTANA

1970 CENSUS 10,526

SCALE IN FEET

1400 0 1400 2800

REVISED DEC. 31, 1971



LEGEND

RESTRICTED PARKING



ANGLE PARKING



ONE WAY STREET

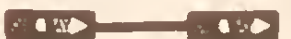
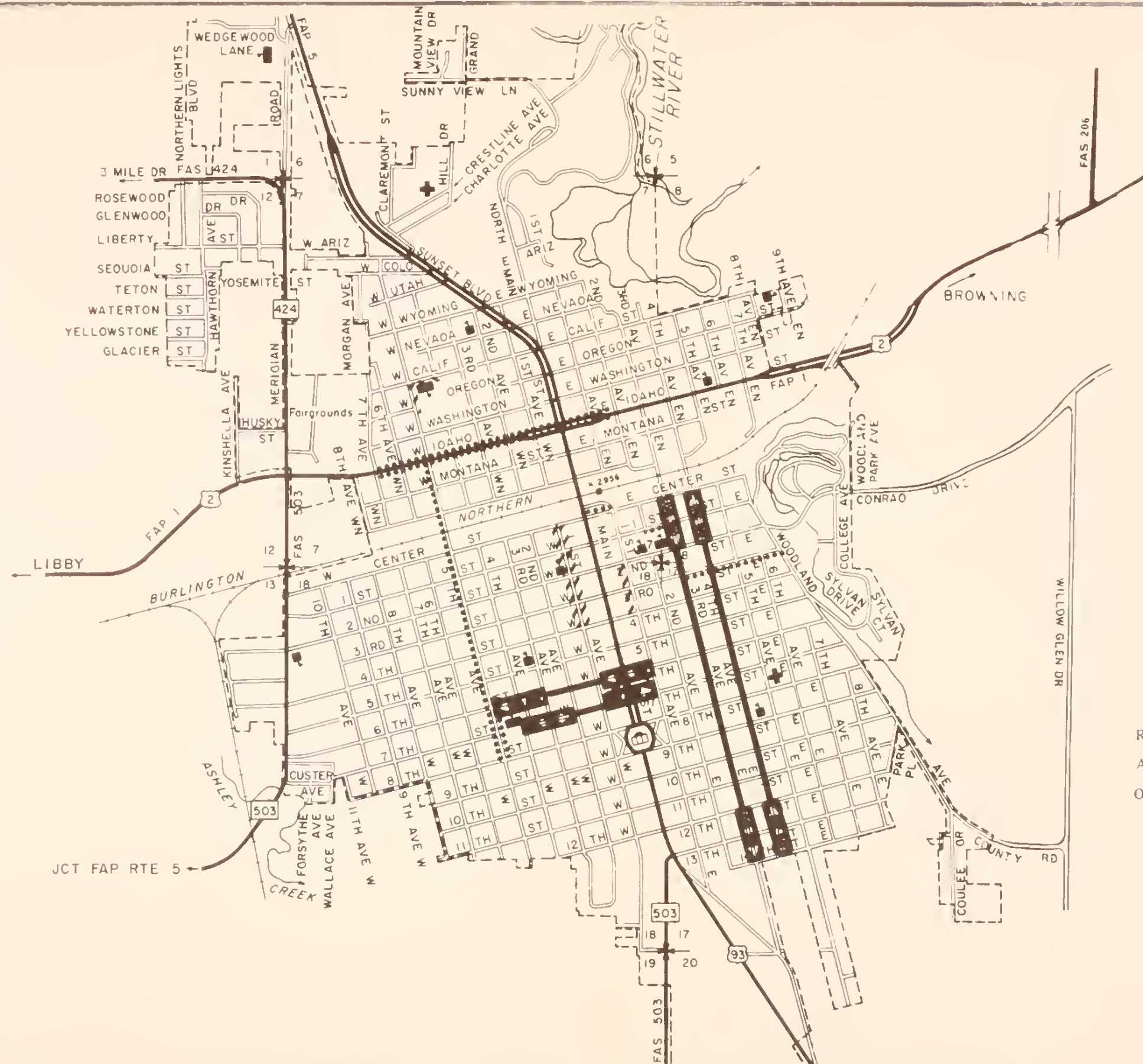


EXHIBIT 12
PARKING RESTRICTIONS
and ONE-WAY STREETS



southern part and any increase in crossings of the yard must be coordinated with B.N. on a design level for each specific case.

Generally speaking, protection of existing crossings consist of signals at the main arterial crossings with little or no protection at minor streets. Train movements are average for this type of operation, with 1 scheduled freight train per day and possibly 8-10 switching movements in and out of the yard. No forecasts are available for future movements and there are no plans for any upgrading of crossing protection by the railroad at present.

The at-grade crossing accident statistics for Kalispell from 1968 to date are as follows:

Meridian Street	-	No Accidents
5th Avenue West	-	1. Auto-train collision, flagman at crossings 2/1/72. Driver's windshield not clear - injury. 2. School bus rear ended by auto 5/15/69 No train on tracks - property damage. 3. Rear end collision - 1st vehicle stopped for train - 3/13/68 - property damage.
Main Street	-	1. Rear end collision - 1st vehicle stopped for train 11/22/69 - property damage.
3rd Avenue East	-	1. Auto-train collision, flagman at crossing 2/25/72 - property damage. 2. Auto-train collision - 10/28/69 - property damage.
4th Avenue East	-	No Accidents

e. Signing and Speed Limits

Generally, signing appears to be poor on the approaches to the arterial streets and in some cases does not conform to the MUTCD.

On certain streets speed limits appear to be set too low.

f. Conclusions

Based upon our analysis of the existing traffic control devices we recommend that the following projects be included in the TOPICS Implementation Program.

1. The CBD Signal System including additional interconnect cable.
2. Incorporate street lights and signing as part of any project improvement under the TOPICS Program.

The following items were either too small or outside the scope of this program. We would recommend that the City or County study or change the traffic control devices as follows:

Traffic Signals

1. Remove 4-way red flasher at 2nd Street and 2nd Avenue West or change the lenses to amber street and install STOP Signs on 2nd Avenue West.
2. Reconstruct flasher at school crossing on 5th Avenue West or remove the entire installation.

Illumination

1. The City and County should establish design standards and develop a master plan for upgrading the lighting levels on all arterial streets.

Railroad Crossings

No recommendations.

Signing

1. Replace the "YIELD" Sign with a "STOP" Sign for southbound movement on Willow Glen Drive (FAS 317) at its intersection with County Road (extension of Woodland Avenue) in order to alleviate a sight distance problem caused by a sag vertical curve to the north

of the intersection. Predominant movement appears to be from south on FAS 317 to Woodland Drive.

2. Replace “YIELD” Sign with “STOP” Sign for southbound movement on Woodland Park Avenue at its intersection with Conrad Drive in order to diminish accident rate. Movement is a 50-50 split between the north leg and east leg of the intersection.
3. Evaluate signing program. Develop a plan for updating or replacing all sign installations. Inquire from the office of the Safety Director about available funds for the planning and replacement of sub-standard signs. In cooperation with the Montana Department of Highways, conduct engineering analysis for setting speed limits on arterial streets. Items to be included in the analysis are 85 percentile speed, adjacent land use, access control and median development, roadway quality and width, pedestrian and bicycle provisions, etc.

5. Programmed Construction Projects

In an effort to prevent duplication of potential work items under the TOPICS Program with any other planned construction programs, information is presented in Exhibit 13 indicating the year, project location, and work description of the presently proposed work activities in the Kalispell Urban Area through 1977. The location of the projects is indicated on Exhibit 14. Coordination with this work program and other proposed projects should be a part of the continuing phase of the TOPICS Program.

The City does not presently have a planned “Capital Improvements Program”, primarily because of lack of funds. Besides the regular maintenance program and assuming the tax structure does not change, the only funds that might be expended on the TOPICS System would be derived from an SID, which, of course, is not programmable.

Two of the proposed TOPICS Projects, Center Street widening and U.S. 2 and U.S. 93 channelization and signalization, overlap Project F-RF9999(57)U1. The intent of Project F-RF9999(57)U1 was to bring all the existing traffic control devices on the FAP System into conformance with the MUTCD for safety and uniformity without any major redesign or reconstruction of the intersections. The two TOPICS Projects suggested in this report expands these signal systems utilizing all of the new signal hardware in order to increase the capacity of those intersections.

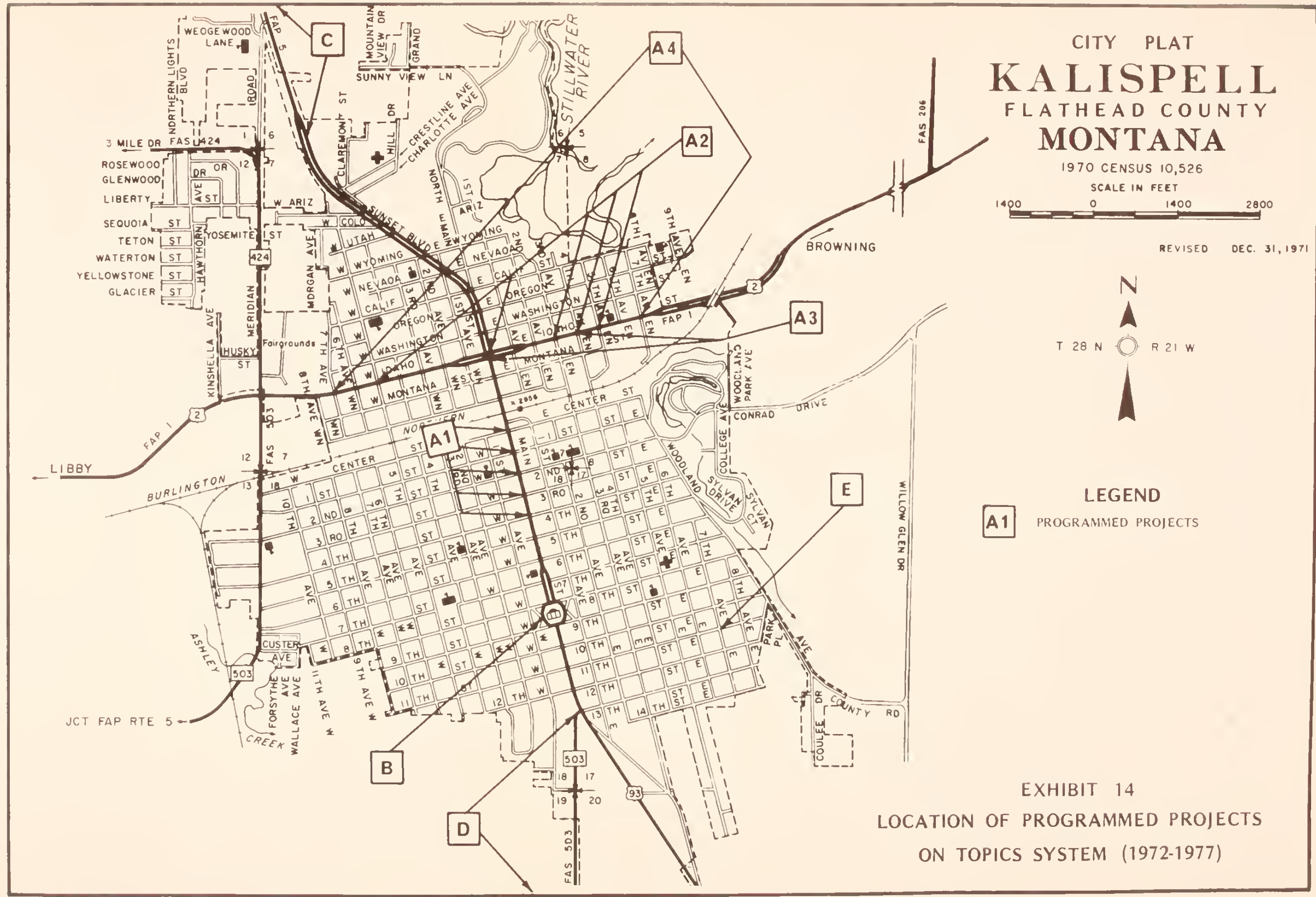
If projects F-270(10)U90 on U.S. 93 and S-RS404 on FAS 503 are not constructed within the proposed time frame or not at all, there is one recommended TOPICS Project on each of these roadway construction projects:

EXHIBIT 13

SUMMARY OF PROGRAMMED PROJECTS ON TOPICS SYSTEM (1972-1977)

*Map Key	Project No.	Prog. Const. Year	Project Location	Termini	Work Description
A	F-RF9999(57)U1	1972	U.S. 93 (Main St.)	North City Limits to South City Limits	Upgrade Existing Signals, Signs, and Markings
A1	"		U.S. 93 (Main St.) @ 1. Center Street 2. 1st Street 3. 2nd Street 4. 3rd Street 5. 4th Street	Center St. to 4th St. (CBD)	Modify Signals by Providing New Signal Displays & Controller "
A2	"		U.S. 2 (Idaho St.) @ 1. 5th Ave. E. 2. 4th Ave. E. 3. 3rd Ave. E. 4. Main St. 5. 5th Ave. W.	5th Ave. E. to 5th Ave. W.	Remove Existing Signal Installation Modify Existing Signals by Providing New Signal Displays Install Signal Equipment Removed from 5th Avenue East Modify Existing Signals by Providing New Signal Displays " " " " " "
A3	"		U.S. 2 (Idaho St.)	4th Ave. E. to Main St.	Install Interconnect Cable
A4	"		U.S. 2 (Idaho St.)	7th Ave. E. to 7th Ave. W.	Remove Parking and Provide Left Turn Lanes at all Intersections
B	U-191(33)	1972	U.S. 93 (Courthouse)	6th St. to 9th St.	Street Widening, Resurfacing, Signing, and Illumination
C	F-270(10)U90	1972	U.S. 93	Sta.52+00 (160'+N/o Drive-In-Theatre Entrance) N. to Sta. 92+00	Street Widening (70' sh. to sh. w/6' Median) Resurfacing, and Signing
D	S-RS404	1973-1974	FAS503(So. Loop)	U.S. 93 to 3.5 Miles South	Street Widening (41'), Curb and Gutter, Signing
E		1972	11th Street	Woodland Ave. to 5th Ave. W.	Construct New Curb and Gutter, and Street Improvements as Required for 34 foot Curb to Curb Roadway Section

*See Exhibit 12. for Project Locations



CITY PLAT
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FLATHEAD COUNTY
MONTANA

1970 CENSUS 10,526
SCALE IN FEET
1400 0 1400 2800

REVISED DEC. 31, 1971



LEGEND
A1 PROGRAMMED PROJECTS

EXHIBIT 14
LOCATION OF PROGRAMMED PROJECTS
ON TOPICS SYSTEM (1972-1977)

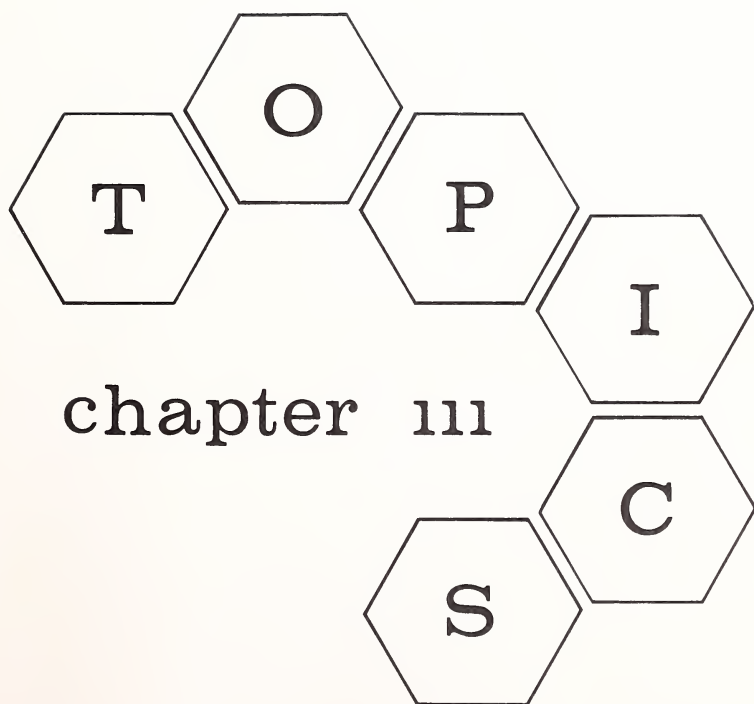
- a. Intersection of FAS 503 (Airport Road) and U.S. 93 (Main Street).

This intersection creates one of the large intersections on South U.S. 93 producing excessive areas of potential conflict. As a TOPICS Project, the work would consist of aligning 13th Street and Airport Way, channelization on west side of U.S. 93 to reduce conflict area, installation of left turn lanes on U.S. 93 and appropriate signing. This project could be included in the U.S. 93 Access Project.

- b. Intersection of Meridian Road and U.S. 93.

This intersection is not defined and very poorly delineated especially at night. As a TOPICS Project, the work would consist of reconstructing the intersection with larger turning radii and a short deceleration right turn lane in order to encourage the diversion of City-destined movements from the U.S. 2 and U.S. 93 Intersection to Meridian Road - Center Street for trucks and Meridian - 2nd Street or 6th Street for autos and of installing street illumination in the intersection area and guide signing.

Since these two State Projects are planned for improvement on other funding projects, no further mention is included in the TOPICS Implementation Program, and they are not considered in the priority array. If not constructed, they should be added as inputs during the continuing phase of the TOPICS Program.



CHAPTER III

IMPLEMENTATION PROGRAM

1. FA System Review

Possible system changes for the Primary Type I and the Secondary Systems were studied in conjunction with the Tentative Type II System, the existing street network and traffic generators, importance to the County and State, and proposed circulation system contained in the Comprehensive Development Plan. No additions or deletions are recommended for the FAP I and FAS Systems.

The tentative TOPICS System was developed in cooperation with the City, County, and State Agencies. It is recommended that no revisions be made to this system at this time; thus, the Tentative TOPICS System becomes the Recommended TOPICS System. At the present time, many of the Primary Type II Streets do have low traffic volumes, few accidents, and are not recommended for any TOPICS improvements. However, very few of the arterial streets are utilized as arterial streets because of the philosophy of eliminating secondary arterial streets through the residential areas.

The recommended Type II or TOPICS System, as shown in Exhibit 16 and mileage chart summarized in Exhibit 15, contains the completed street system developed to serve the present needs and to accommodate future expansion for the Kalispell Urban Area. This plan is basically in agreement with the goals and objectives of the circulation element of the unapproved Comprehensive Development Plan. As of this writing three streets have been deleted from the circulation element, namely Eleventh Street, Sixth Street, and Woodland Avenue. The basic discussion revolving around these streets centers on a controversy of developing east-west traffic flow on certain routes as opposed to random flow on all streets within the residential area. It is our recommendation that these streets remain on the TOPICS System and that the City and County re-examine their position on their interpretation of what constitutes the proper development of an arterial street grid system. By so recommending this Type II System, we would encourage the City to adopt certain east-west streets as collector and secondary arterials for the overall circulation development of the Urban Area. In terms of traffic control, circulation and overall community traffic safety, this would be to their advantage.

In analyzing the east-west traffic flow, the incorporation of 5th Street and 6th Street to form a future potential one-way couplet would be of considerable benefit to the motorist, without requiring traffic to move through the Central Business District. Center Street has good potential for a cross town connector; however, due to the combination industrial-commercial development over the major portion of this route,

it is our recommendation that Center Street be designated primarily as a truck route, but to remain on the TOPICS System. Second Street can serve the function of a cross town connector allowing traffic the option of avoiding the truck traffic on Center Street. Eleventh Street, with the City's recently completed roadway widening project and allowing parking on one side only, would provide a good cross-town connector on the south side of the City.

The north-south traffic movement is confined primarily to Main Street (U.S. 93) which presently causes the Intersection of Main Street (U.S.93) and Idaho Street (U.S.2) to operate near capacity. All north-south arterial streets, except for Main Street, have adjacent residential land uses.

Consequently, in order to divert some flow from the Main Street Corridor, the City should undertake to develop the other north-south arterials with proper east-west connectors in order to increase the mobility of the intracity traffic, and to reduce the congestion at the Idaho Street (U.S.2) and Main Street (U.S.93) Intersection.

It is our recommendation that all the collector or secondary arterials bounded by Meridian Road on the west, Idaho on the north, Woodland Avenue on the east, and 11th Street on the south, remain on the TOPICS System. It should be noted that the traffic volumes are low on these arterial streets; however, at the present time the arterial network is not properly traffic signed or controlled, thus allowing a dispersion on all of the residential streets feeding into Main Street.

EXHIBIT 15

TOPICS SYSTEM MILEAGE

Federal Aid Primary I	Miles	% of System
U.S. Highway No. 2 - Idaho Street	4.77	
U.S. Highway No. 93 Main Street - Sunset Boulevard	4.34	
Total	9.11	29.43
Federal Aid Secondary		
Three Mile Drive 2.1"	0.24	
Meridian Road 18.8"	2.14	
LaSalle Road	1.70	
Airport Road	0.92	
Conrad Drive	1.16	
Willow Glenn Drive	2.22	
Total	8.38	27.08
Federal Aid Primary Type II		
Center Street 10.65	1.21	
1st Street	0.15	
2nd Street	1.27	
3rd Street	0.15	
4th Street	0.15	
5th Street	1.40	
6th Street	1.44	
11th Street	0.99	
4th Avenue East	1.21	
3rd Avenue East	1.74	
1st Avenue East	0.42	
1st Avenue West	0.42	
5th Avenue West	1.01	
Fourteenth Street	0.07	
Woodland Avenue	1.17	
Woodland Park Avenue	0.37	
Conrad Drive	0.30	
Total	13.47	43.49
Total System	30.96	100.0

PLAT
KALISPELL
 FLATHEAD COUNTY
 MONTANA

SCALE IN FEET
 1600 0 1600 3200

REV 12/31/71



LEGEND

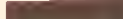
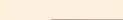
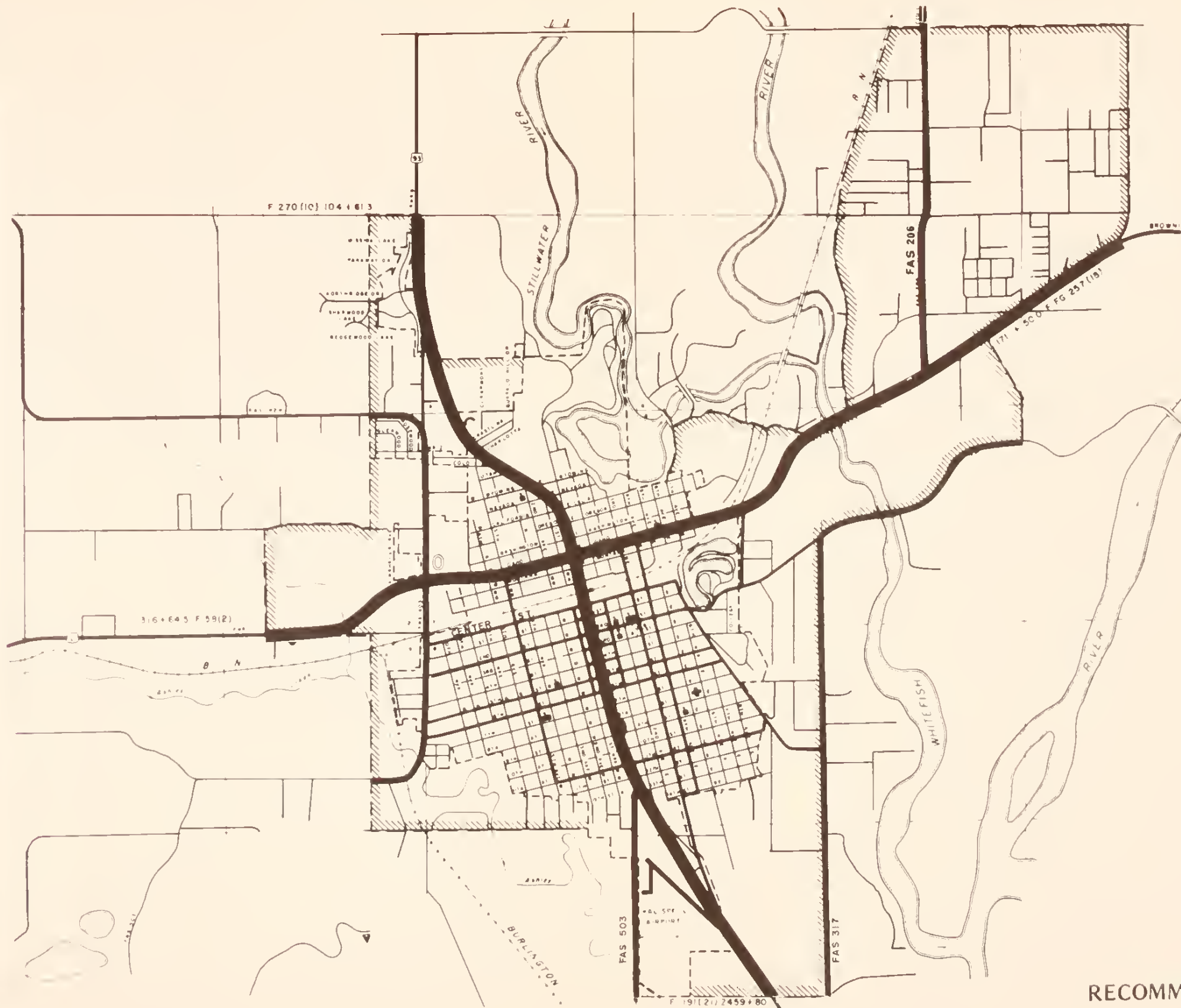
-  FAP I
-  FAS
-  FAP II

EXHIBIT 16

RECOMMENDED TOPICS SYSTEM



2. Project Array

The projects recommended in this study were evaluated as to priority using a cost-effectiveness technique. All potential projects were analyzed using a logical set of parameters whereby the improvements can be rated in a systematic sequence that establishes a general array for implementation.

The existing deficiency parameters include:

- Capacity
- Number of Accidents and Accident Rate
- Number of Conflict Points - Hazard Potential for Accidents
- Travel Time (Delay)
- Pedestrian and Bicycle Activity
- Route Continuity and Importance to the Street Network
- Geometric Configuration of the Street and Intersections, and Conformance to MUTCD

These elements were chosen because they reflect best the types of projects eligible for TOPICS participation and yet allow a judgment as to the significance of the improvement to the highway network and the transportation planning process. Each of the above parameters is weighted equally without emphasis of one over another.

Each project is analyzed according to each of the above parameters, and a numerical value, either zero, one, three or five, will be assigned to that project to indicate the severity of the existing deficiency. For example, a proposed improvement with a particularly severe overall situation could have a maximum of thirty-five deficiency points. The points method stipulates that the higher the total, the worse the existing condition and vice versa. Therefore, a basic assumption is that if the project is constructed, therein lies the potential for the removal of the deficiency points.

The volume is placed into the analysis to indicate the use of a facility. In effect, a weighting factor is applied to each project. The last input into this system is that of cost. Ultimately, what is derived from these inputs are cost effective projects if the deficiency points, ADT, and costs are considered in the following manner:

$$\text{COST EFFECTIVE RATE} = \frac{\text{D.P. (ADT)}}{\text{COST}}$$

By using this method it is possible to array the potential projects in a manner that should be indicative of the most beneficial projects. It should be noted here that it was decided to use this approach in lieu of the standard benefit-cost analysis because, in our opinion for planning purposes, the application of intangible monetary values, such as delay costs and accident reduction costs to hypothesized benefits, such as predicted accident reduction or accident hazard elimination, is inappropriate and that cost-effectiveness is more indicative to capacity and safety improvements.

The cost-effectiveness technique produces the array shown in Exhibit 17 which provides a general indication of the relative importance of the projects.

EXHIBIT 17

COST EFFECTIVENESS - ARRAY

Project	Total Deficiency Points	AADT Affected	Cost	Cost Effectiveness
U.S. 2 & U.S. 93 Signal & Channelization	29	23,000	19,300	35
U.S. 2 & LaSalle Road Center Street Widening	11	10,500	5,400	21
U.S. 93 Access	23	6,000	8,000	17
CBD Signal System	18	8,500	20,000	8
Meridian & U.S. 2 Signal	25	35,000	130,000	7
5th & 6th St. 1-way Couplet	21	8,500	35,000	5
1st Ave. E. & 1st Ave. W.	19	6,000	30,000	4
Meridian Road Widening	13	15,000	50,000	4
3rd Ave. E. & 4th Ave. E. 1-way Couplet	18	2,800	25,000	2
Woodland and 11th Street Intersection Improvement	15	4,000	30,000	2
Main St. & 11th St. Signal	14	4,000	30,000	2
Conrad Drive	7	3,000	20,000	1
4th Ave. E. Road Construction for End Condition on 1-way Couplet	14	4,000	100,000	0.6
1st Ave. E. & 1st Ave. W. R.R. Crossing	5	1,200	35,000	0.2
	2	15,000	200,000	0.1

3. Implementation

The final Recommended TOPICS Implementation Program is developed on the basis of the project array in Exhibit 17 and with further consideration given to the following criteria, not necessarily in the order shown:

- Construction Cost
- Current Maintenance Problems and Costs
- System Flexibility in Relation to Other Projects
- Immediate Influence Upon Arterial Network

Therefore, the projects are staged and only general priorities have been assigned to each project. Projects that perhaps may not be eligible for TOPICS funding, but otherwise are important for safety and network circulation are listed in the fourth stage. During the continuing phase of the TOPICS Program, these projects in the fourth stage should be reviewed with the other projects listed in stages two and three along with any other problem areas that have developed in the interim. The recommended staging of projects is shown in Exhibit 18. The general location map of the Potential TOPICS Projects is shown on Exhibit 19.

Complete Project Planning Reports have been developed for all projects in Stage I and are reported in Chapter IV. These Project Planning Reports contain all the information necessary for project approval by the State and FHWA, so when TOPICS funds become available, engineering design work may proceed immediately following FHWA approval of the Areawide TOPICS Plan without submitting additional Project Reports.

Projects listed in stages two, three, and four are described in Recommended Project Lists on Exhibit 20. During the continuing phase, if these projects are elevated in priority, if additional TOPICS funds become available, or if traffic growth justifies a project, full Project Planning Reports should be submitted at that time in order to construct the projects with TOPICS funds.

EXHIBIT 18

FINAL PROJECT STAGING (IMPLEMENTATION PROGRAM)

Stage	Group	Project Location	Work Description	Cost	Total Stage Cost No.	Map Ident. No.
I	A	U.S. 2 & Meridian Road CBD	Construct Signal	35,000.00		1
	A		Reconstruct Signal Installations on 1st Street West.	130,000.00		2
			TOTAL 'A'		\$165,000.00	
	B	U.S. 2 and U.S. 93	Channelization and New Signal Control.	19,300.00		3
	B	Center Street	Widen Roadway	8,000.00		4
	B	U.S. 93 Access	Channelization and Realign Roadways	21,000.00		5
	B	U.S. 2 & LaSalle	Install Median, Modify 3-way Flasher, Resign, and Restripe	5,400.00		6
			TOTAL 'B'		\$ 53,700.00	
			TOTAL STAGE I		\$218,700.00	
II		5th Street & 6th Street	Install One-way Couplet	30,000.00		7
		3rd Avenue & 4th Avenue	Install One-way Couplet, Construct Connector Road	30,000.00		8
		Meridian Road	Widen Roadway on One Side for Pedestrian Walkway	25,000.00		9
			TOTAL STAGE II		\$ 85,000.00	
III		Woodland & 11th St.	Realign Intersection	30,000.00		10
		Main Street & 11th Street	Construct Signal	20,000.00		11
		4th Avenue E.	Construct Roadway for New End Condition on One-way Couplet	35,000.00		12
			TOTAL STAGE III		\$ 85,000.00	
IV		1st Avenue E. & 1st Avenue W.	One-way Couplet	50,000.00		13
		Conrad Drive	New Alignment	100,000.00		14
		1st Avenue E. & 1st Avenue W.	RR Crossing	DELETE		15
			TOTAL STAGE IV		\$150,000.00	
TOTAL COST ALL PROPOSED TOPICS IMPROVEMENTS					\$538,700.00	

POTENTIAL TOPICS PROJECTS



EXHIBIT 20
RECOMMENDED PROJECT LIST

LOCATION	PROJECT WORK DESCRIPTION	EXISTING CONDITIONS & PROJECT JUSTIFICATION
5th Street and 6th Street Between Woodland Avenue & Meridian Road	1. Install all necessary signing to establish a one-way couplet. 2. Make minor striping revisions in CBD. 3. Reconstruct curb returns at selected locations such as at 6th Street and Woodland Avenue. 4. Install signal at 6th Street and Main Street. Total Estimated Cost \$30,000.00	1. Both 5th Street and 6th Street traverse through a residential area except for four blocks in the CBD Area. The streets vary in width from 30' to 54' with parking allowed on both sides. If properly developed as a secondary arterial providing 1 lane of travel in each direction, the project would greatly enhance the circulation system in the Urban Area. Alternatives to the suggested one way system are to: 1) Remove parking on both sides of one street or 2) Widen one street to 40' which is not a TOPICS Project. Since the streets are in a residential area where parking is desirable from a convenience standpoint for the home owner, the one-way couplet is the recommended alternative. 2. Necessary to implement project. 3. Necessary for a two-way street and desirable for one-way streets. 4. The signal is not warranted at this time under warrant No. 1, however, the signal would be justified under the volume warrant and the Progressive Movement Warrant. In order to provide a desirable route that is convenient to traverse, a signal should be installed at 6th Street and Main Street and interconnect with the others on Main Street. Proper platoons of traffic can be created on Main Street (Signal spacing 660') so that a 20 to 25 second gap is created at 5th Street.

RECOMMENDED PROJECT LIST

LOCATION	PROJECT WORK DESCRIPTION	EXISTING CONDITIONS & PROJECT JUSTIFICATION
3rd Avenue E. and 4th Avenue E. Between Idaho Street (U.S.2) and Center Street.	1. Install all necessary signing to establish a one-way couplet. 2. Rephase signal at 3rd Avenue E. and U.S. 2 to provide protected Left Turn control. 3. Construct connector Road between 3rd E. and 4th E. for U Turn and Circulation for vehicles destined for shopping center. An alternative to constructing a connector roadway on a public right-of-way would be to negotiate with the property owner to rearrange the parking lot layout to provide the circulation on private property. 4th Street would then be two-way from the driveway closest to Idaho Street to the connector driveway. The southbound lane would be channelized from the remainder of the roadway. Total Estimated Cost \$30,000.00	1. Both 3rd Avenue E. and 4th Avenue E. traverse through a commercial-light industrial area. To the south 3rd Avenue E. and 4th Avenue E. form a one-way couplet through a residential area. The one-way couplet would greatly enhance the use of these streets for intracity travel (trucks would be excluded) and provide capacity relief for the U.S.2 and U.S.93 Intersection and Main Street through the CBD. Turning movements at 3rd and 4th with Center Street would be reduced, which will reduce the potential number of conflicts. 2. Because of the heavy right turn movement Northbound on U.S.93 to Eastbound on U.S.2 and the through Eastbound movement on U.S.2 at the U.S.93 Intersection, sufficient gaps are not available for left turning traffic from Westbound on U.S.2 to Eastbound on 3rd Street and thus discouraging the use of 3rd Street and 4th Street as an alternate route to Main Street. (See turning movements at U.S.2 and U.S.93 in Project Planning Report). 3. Due to the location and existing layout of the shopping center between 3rd Street and 4th Street and to the west of 3rd Street, U Turns would occur on Idaho Street between 3rd Street and 4th Street in order to reverse direction on the one-way couplet.

RECOMMENDED PROJECT LIST

LOCATION	PROJECT WORK DESCRIPTION	EXISTING CONDITIONS & PROJECT JUSTIFICATION
Meridian Road Between 3 Mile Drive and U.S. 93.	1. Widen Roadway to provide an asphalt shoulder on the west side primarily for pedestrians or construct an asphalt sidewalk adjacent to the property line on the west side. 2. Reconstruct Meridian Road and U.S.93 Intersection if the State Highway Project No. F-270(10)U90 is not constructed. Total Estimated Cost \$25,000.00	1. & 2. Currently, pedestrians - school children must walk on the roadway to go to the Junior High School located at the Intersection of Wedgewood Lane and Meridian Road. Meridian Road is 20' wide with an 0-2 foot shoulder. It is estimated that approximately 50% of the trucks and 35% of the autos from north of Meridian Road currently using the Intersection of U.S.2 and U.S.93 can be diverted to Meridian Road providing a signal is installed at U.S.2 and Meridian Road and the Intersection is improved at U.S.93 and Meridian Road. Secondly, a new hospital and clinic is to be located on the east side of U.S.93 south of the Meridian Road Intersection, and Flathead Valley Community College has an option on land on U.S.93 north of Meridian Road which should create higher turning movements at U.S.2 and U.S.93. Again, Meridian Road could be developed as an alternate route. However, the increased traffic on Meridian Road would present a tremendous hazard to the school children by increasing the potential for an auto-pedestrian collision.

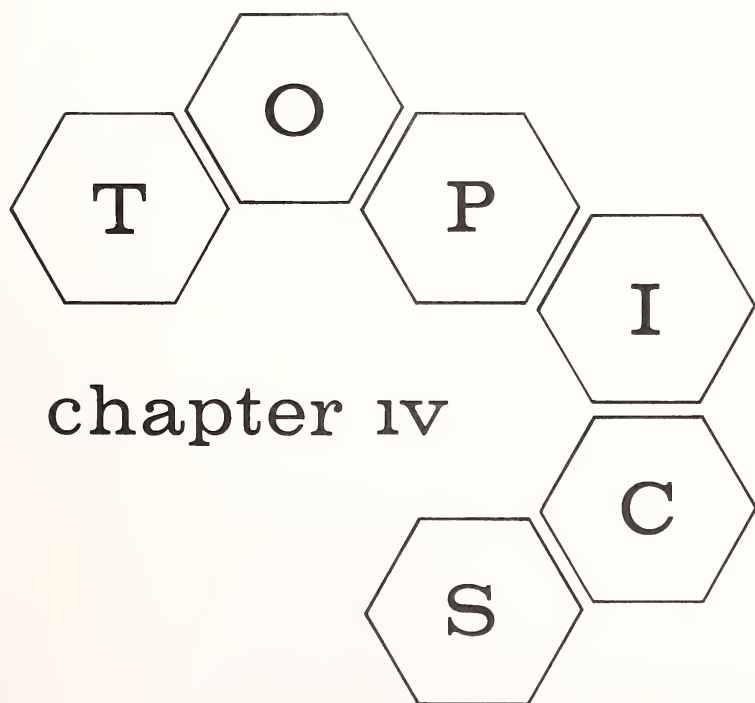
RECOMMENDED PROJECT LIST

LOCATION	PROJECT WORK DESCRIPTION	EXISTING CONDITIONS & PROJECT JUSTIFICATION
Woodland Avenue and 11th Street	I. Eliminate street jog and construct 11th Street on new alignment to form a "T" intersection with Woodland Avenue - approximate distance is 200'. Install 36' wide roadway, curb, gutter and sidewalk. Right-of-way would be required. Total Estimated Cost \$30,000.00	I. The two roadways intersect at approximately 45°. 11th Street roadway is 34' wide with curb, gutter, and sidewalk. A sag vertical curve to the south of the intersection on Woodland Avenue creates a sight distance restriction that is less than minimum for a 25 MPH facility. The 45 angle restricts the use of 11th Street as an alternate collector arterial. The intersection did not appear on the high accident rate list but does present a serious accident hazard to the motorist.
Main Street and 11th Street	Construct a semi-actuated signal with pedestrian heads. Total Estimated Cost \$20,000.00	At present, this intersection does not meet signal warrants in the MUTCD. Assuming a grid network is established for the secondary and collector street system, and based upon the trip generation from the residential areas to the east and west of Main Street and the 1972 volume counts, this intersection should be justified in three to four years under the volume warrant.

RECOMMENDED PROJECT LIST

LOCATION	PROJECT WORK DESCRIPTION	EXISTING CONDITIONS & PROJECT JUSTIFICATION
4th Avenue East South of 14th Street	Construct Roadway for One-way couplet end condition between 14th Street and 3rd Avenue East. Right-of-way would be required. Total Estimated Cost \$35,000.00	No roadway exists at present. 3rd Avenue E. and 4th Avenue E. form a one-way couplet north of 14th Street. 14th Street is currently used as the end condition for the two-way traffic flow on 3rd Avenue E. south of 14th Street. Current traffic volume on 3rd Avenue E. south of 14th Street is 1200 AADT. This project would enhance the overall intracity circulation system and would divert some traffic from Main Street. However, based upon 1972 volumes on Main Street and 3rd Avenue E. (9000+ AADT across screen line in vicinity of 14th Street extended), the project would probably not be fully justified for three or four years unless as per the Comprehensive Development Plan, the residential and light industrial land uses to the southeast of 4th Avenue E. develop more rapidly than is currently anticipated.
1st Avenue E. and 1st Avenue W. Between the Courthouse and Center Street.	1. Install all necessary signing to establish a one-way couplet. 2. Construct new roadways at both the southend and northend to convert from one-way system to two-way system. Right-of-way would be required. 3. Main Street would be "closed" to through traffic. Mall and/or closure would not be financed by TOPICS. Total Estimated Cost \$50,000.00	This project is entirely dependent upon the soon-to-be completed CBD Development Plan. The one-way system would smooth the traffic flow and reduce the accident potential (Average number of accidents on Main Street between Center Street and 4th Street is 32 per year) by being able to provide better progression and speed control on the one-way streets. Note: It is not the intent to fully justify or describe the work to be done at this time. A rigid traffic analysis would have to be conducted by the City-County Planning Board during the CBD Development Plan Stage. This analysis must provide justification for the project and can be used to update this Areawide Plan during the continuing phase.

LOCATION	PROJECT WORK DESCRIPTION	EXISTING CONDITIONS & PROJECT JUSTIFICATION
Conrad Drive Between Woodland Park Avenue and Woodland Avenue	Construct Conrad Drive on a new alignment utilizing existing right-of-way along college Avenue and on new right-of-way on the hillside to connect with 5th Street and/or 6th Street at Woodland Avenue. Right-of-way would also be required at the Intersection of College Avenue and Conrad Drive. Remove the existing Conrad Drive from the Type II System and use for park access only with no through traffic. Or construct any other connector road from the residential area to the east of Woodland Avenue to the east-west arterial system. Total Estimated Cost \$100,000.00	Conrad Drive is 20' wide with no shoulders or sidewalk. The City Park lies adjacent to the Roadway on the north side. Bicycle and pedestrian activity is heavy during the summer months. Roadway is in poor condition. Conrad Drive is the only secondary arterial that connects the CBD with the residential areas east of the City. The land use plan indicates that this area will be one of four areas outside the City Limits that will have increased residential development. This project is included in this list for the sole purpose of providing another alternate to consider for the total development of the arterial system. One proposal set forth by a group in the City is to discourage traffic on Conrad Drive and divert the traffic flow to Woodland Park Avenue and U.S.2. Based upon the destinations of that intracity traffic, this diversion would automatically cause the Intersection of U.S. 2 and U.S. 93 to operate at a volume/capacity (V/C) ratio considerably greater than 1.0. A solution must be found for this problem area and planning adhered to without relying upon Idaho Street and Main Street to carry this additional traffic burden.
1st Avenue E. and 1st Avenue W. Between Center Street and Idaho Street	Construct new roadways across railroad tracks. Right-of-way would be required. Total Estimated Cost \$200,000.00	Presently there are no roadways across the railroad tracks. Based upon a brief traffic analysis, the two new signalized intersections on Idaho Street would cause Idaho Street to operate at a volume/capacity ratio much greater than 1.0 because it would be impossible to provide any progression of traffic on Idaho Street for those operating conditions. Therefore, the project should be deleted from any future or proposed circulation plans.



CHAPTER IV

PROJECT PLANNING REPORTS

The following are complete project planning reports for all projects in Stage I as indicated on Exhibit 18, Final Project Staging.

TOPICS IMPROVEMENT PROJECT

IDAHO STREET (U.S.2) AND MERIDIAN ROAD (FAS503)

Introduction

Idaho Street (U.S.2) is the main east-west highway through the City of Kalispell, serving the needs of both through and local traffic. Meridian Road is a Federal Aid Secondary Highway designated Route No. 503. This intersection has experienced a traffic volume increase of approximately 27% from 1970 to 1972 due to commercial development of Idaho Street, the construction of a new Junior High School approximately 1 mile north of Idaho Street on Meridian Road, and increase of residential development in the northwest section of the urban area. Additionally, the City of Kalispell has annexed 50 acres to the north and west of this intersection for a proposed Safeway Store, an electrical store, a drugstore and a clothing store. The City has also annexed 17 acres to the west of Meridian Road for a Gibson Discount Store. A Chevrolet Dealership is also proposed for construction on the south side of U.S. No. 2 west of Meridian Road. This construction will further add to the traffic volumes at U.S. No. 2 and Meridian Road.

Justification

This intersection has the second highest accident rate in the City (1.77) and is ranked fourth for the highest number of accidents (5.5/year averaged for 2 years). Since the major traffic flow at this intersection is from the east of Idaho Street going north on Meridian Road, and vice versa, traffic volumes are somewhat balanced, i.e., 2,500 ADT for Idaho Street to the west and Meridian Road to the South. The east leg has 6,500 ADT and the north leg 5,000 ADT.

Of the 11 accidents over the past two years, 4 right angle accidents and possibly 3 of the rear end accidents are correctable by signalization.

Based upon interurban area travel and the street network capabilities, Meridian Road to the north of the intersection can be considered as a major leg within the context of the MUTCD and is definitely not used as a collector street. It was determined that Warrant No. 1, Minimum Vehicular Volume of the Manual of Uniform Traffic Control Devices would meet the requirements using the 70% factor when the intersection lies within the built-up area of an isolated community having a population of less than 10,000. (The actual population is 10,526). See traffic signal warrant. This intersection meets over 70% of the warrant, not considering pedestrian-school children crossing. The intersection fully meets Warrant No. 7 in that a minimum of over 800 vehicles enter the intersection during peak hour.

A signal at this intersection should help divert some of the existing and future traffic generated to the proposed development of a hospital and Flathead Valley Community College to be located on U.S. 93 in the vicinity of Meridian Road from the U.S. 2 and U.S. 93 Intersection. Although a classification count was not undertaken based upon field observation (when manual turning movement count was made), the truck volume represents approximately 10% of the AADT. The majority of trucks are 5 axle rigs with incumbent slow acceleration characteristics. Therefore the trucks using Meridian to gain access to the commercial area have a long exposure time to cross U.S. 2. A signal will help reduce this accident potential.

Work To Be Done

Install new two phase semi-actuated controller with loop amplifiers and interconnect device. Idaho Street will have two 35' mast arm signal poles with 12" diameter signal head indications because of the horizontal curve on the west leg and the approach speed is approximately 40 MPH; and Meridian Road will have 12" diameter red indications and 8" diameter yellow and green indications. The intersection will have three crosswalks with pedestrian signals. A crosswalk is not being installed on the east approach in order not to conflict with the heavy SB to EB movement from Meridian Road. In addition to street striping and signing, some guard rail modification will be required, and street widening on the southerly leg of Meridian Road. Install an aerial interconnect cable between Meridian Road and Main Street on Idaho Street. Install an interconnect device at 5th Avenue West and Idaho Street (If not one in cabinet).

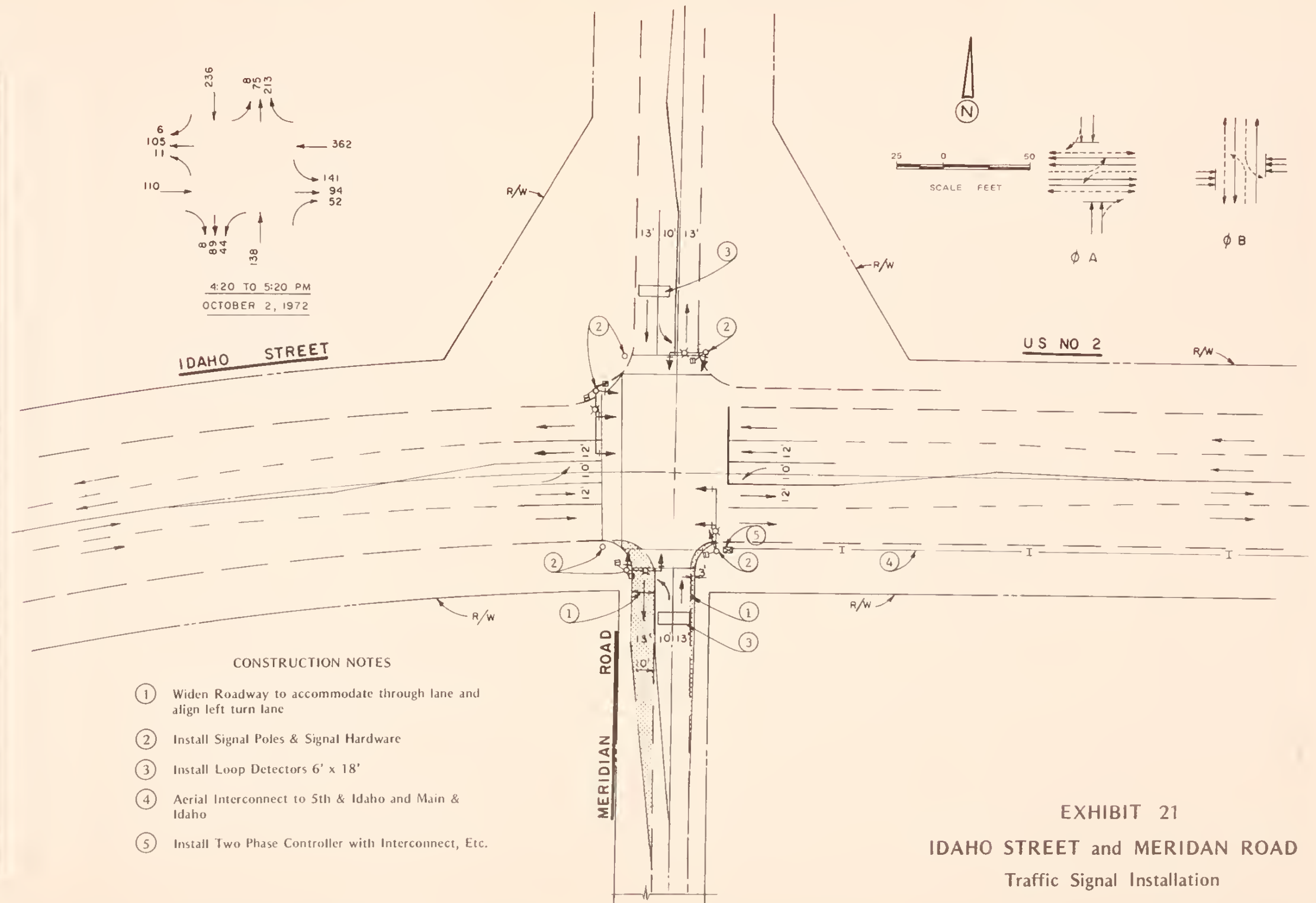


EXHIBIT 21
IDAHO STREET and MERIDIAN ROAD
Traffic Signal Installation

U.S. NO. 2 AND MERIDIAN ROAD

COST ESTIMATE

Description		Est. Quantity	Unit	Unit Cost	Total Cost
1.	2 Phase Type 2 Semi-actuated Controller w/Cabinet Complete, Installed	1	Ea.	3,500.00	3,500.00
2.	Signal Poles w/Foundations Including Luminaires				
	35' mast arm	2	Ea.	2,800.00	5,600.00
	20' mast arm	2	Ea.	2,200.00	4,400.00
3.	Pedestrian Heads	6	Ea.	190.00	1,140.00
4.	Conduit and Wire	250	L.F.	6.00	1,500.00
5.	Junction Boxes (installed)	5	Ea.	65.00	325.00
6.	Service	1	Ea.	200.00	200.00
7.	Ped. Push Button Poles, Installed	2	Ea.	100.00	200.00
8.	Inductive Loops	2	Ea.	250.00	500.00
9.	Street Excavation	62	C.Y.	3.00	186.00
10.	Street Construction	1380	S.Y.	5.00	6,900.00
11.	Street Striping & Signing & Guard-rail Modification	1	L.S.	300.00	300.00
12.	Aerial Interconnect Cable	3800'	Ft.	1.00	3,800.00
13.	Interconnect Device at 5th Ave. W. & Idaho St.	1	Ea.	150.00	150.00
Subtotal					28,701.00
Contingencies 10%					2,870.00
					31,571.00
Const. Engr. 10%					3,157.00
Grand Total					\$34,738.00

COLLISION DIAGRAM

CITY OF KALISPELL

JUNE 1970 to JULY 1972

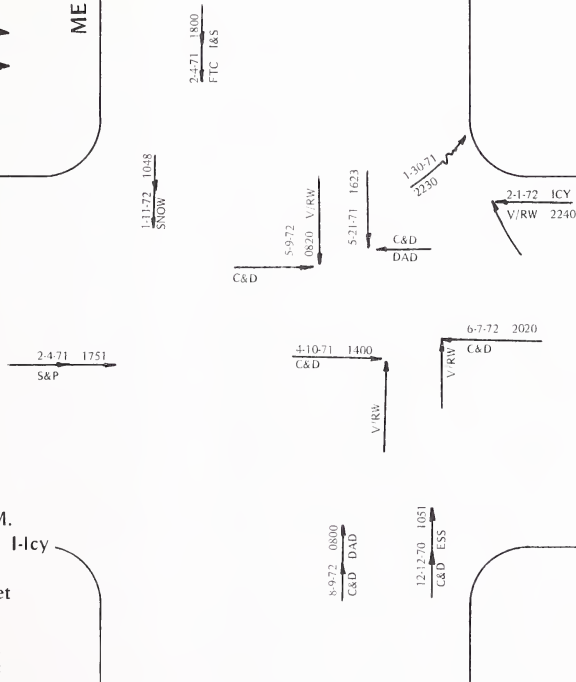
LEGEND - SYMBOLS

- Moving Vehicle →
- Backing Vehicle →
- Pedestrian →
- Fatal ●
- Injury ○
- Parked Vehicle ☒
- Fixed Object □
- Overturned ○→
- Out of Control 〰→

MERIDIAN ROAD

LOCATION Meridian Rd. & Idaho St.

U.S. No. 2 Idaho St.



LEGEND

Time ____ A=A.M. P=P.M.
 Pavement - D=Dry W=Wet I-Icy
 Weather - C=Clear F=Fog
 R=Rain SL=Sleet
 S=Snow

PROBABLE CAUSE

Exceeding Safe speed (ESS)
 Exceeding Speed limit (ESL)
 Ran Stop sign (RSS)
 Ran Signal (RS)
 Stopped, then proceeded (S&P)
 Following too close (FTC)
 Wrong side of road (WSR)
 Violated right of way (V/RW)
 Had been drinking (HBD)
 Did not see traffic (NSTC)
 Control Device
 Driving attention diverted (DAD)
 Mechanical Failure (MF)

ACCIDENT SUMMARY

TYPE	DAY			NIGHT			TOTAL		
	Fatal	Inj.	P.D.	Fatal	Inj.	P.D.	Fatal	Inj.	P.D.
Right Angle			3			1			4
Rear End			1		2	2		2	3
Left Turn					1			1	
Sideswipe									
Pedestrian						1			1
Other									

TRAFFIC SIGNAL WARRANT

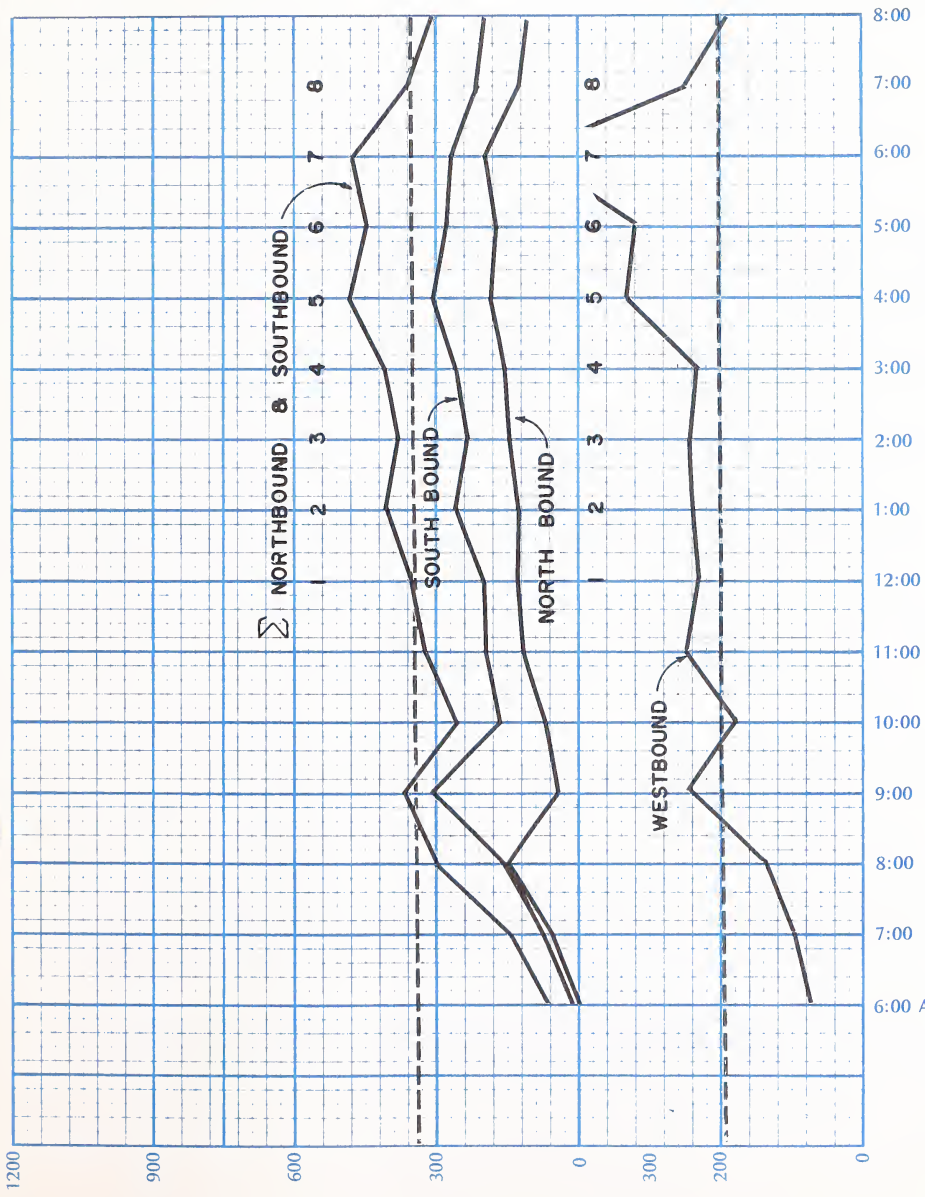
Location IDAHO ST. & MERIDIAN RD.

WARRANT
NO. 1 350
VPH MAJOR
ST. MERIDIAN

350 - 70 %

WARRANT
NO. 1 200
VPH MINOR
ST. IDAHO

200



COUNTS TAKEN OCT. 2, 1972

TOPICS IMPROVEMENT PROJECT

CBD SIGNAL SYSTEM

Introduction

The Kalispell Central Business District is the primary retail center for the Northeastern corner of the State.

There are currently twelve signalized intersections within the Central Business District. Five on Main Street, four on 1st Ave. West and three on 1st Avenue East. The signals on Main Street between Center Street and 4th Street are currently being upgraded under Project F-RF9999(57)U1. The construction program calls for the complete removal of all existing signal hardware and the installation of mast arm signal displays on Main Street and post mounted displays on the side streets, new controllers with two dial, triple offset capability and pedestrian signal heads. A master controller is being located at Main Street and 2nd Street.

The signals on 1st Avenue East and 1st Avenue West are all four way, four section span wire mounted signals with no pedestrian signal heads; the controllers are approximately twenty years old with single offset, one dial operation capability only.

A capacity analysis of all the Central Business District location indicates that there is a problem only at the Intersection of Main Street and Center Street.

The 1970 - 1972 accidents, which are shown on the CBD Inventory Map, break down as follows:

1st Avenue West	18 Accidents
Main Street	64 Accidents
1st Avenue East	18 Accidents

Justification

Once Project F-RF9999(57)U1 is completed, there will be no uniformity of signal displays from one intersection to the next as one would traverse any of the east-west streets. Therefore, one might expect the accidents on 1st Avenue East and 1st Avenue West to increase, and the possible accident reduction on Main Street to be less than might have originally been anticipated.

The existing signal system is not in conformance with the Manual on Uniform Traffic Control Devices (MUTCD). The existing interconnect is a four wire system thus not capable

of operating the full potential of the new controllers on Main Street and is definitely not available for emergency control of the signals on Idaho Street, especially at Idaho St. and Main St. Intersection which the City Fire Department desires.

Since the Central Business District is a high activity center with incumbent pedestrian and vehicular conflict problems, pedestrian signals should be in place at all locations.

A Central Business District Area has many unique conditions and circumstances which justify a signalized grid network even though one of the individual intersections within the system may not fully meet minimum requirements contained in the Manual on Uniform Traffic Control Devices necessary to warrant a signal installation.

The proposed signal locations, in conjunction with other proposed installations, will create a signalized grid system encompassing the major portion of the CBD Area. The existence of such a system will enhance traffic circulation and safety within the CBD Area in various ways. With proper signal programming such a system can be highly effective in terms of speed control, uniform traffic flow, vehicle platooning and pedestrian safety, all of which are significant in a CBD Area.

A properly designed signal system, by promoting smoother traffic flow within the grid system can also contribute to the usefulness and longevity of the existing CBD Area. Thus it's potential can be more fully utilized before costly urban renewal or development of satellite shopping areas becomes necessary to alleviate traffic problems.

Vehicle platooning within the signalized grid network is desirable in that gaps are created in the through traffic flow which afford an opportunity for vehicles to more safely enter from driveways, alleys, parking stalls, etc. Furthermore, as a result of this platooning effect, gaps in the traffic are also present at nearby unsignalized intersections outside of the main CBD Area, thus creating safer conditions for pedestrian crossings and left turn maneuvers at these locations.

Pedestrian traffic, especially in terms of pedestrian-vehicle conflicts is always a significant factor in a CBD Area, especially during periods of increased shopping activity such as "pre-school" and "Christmas Rush". Proper signal installations will greatly reduce the potential hazard to the pedestrian crossing the roadway at these intersections.

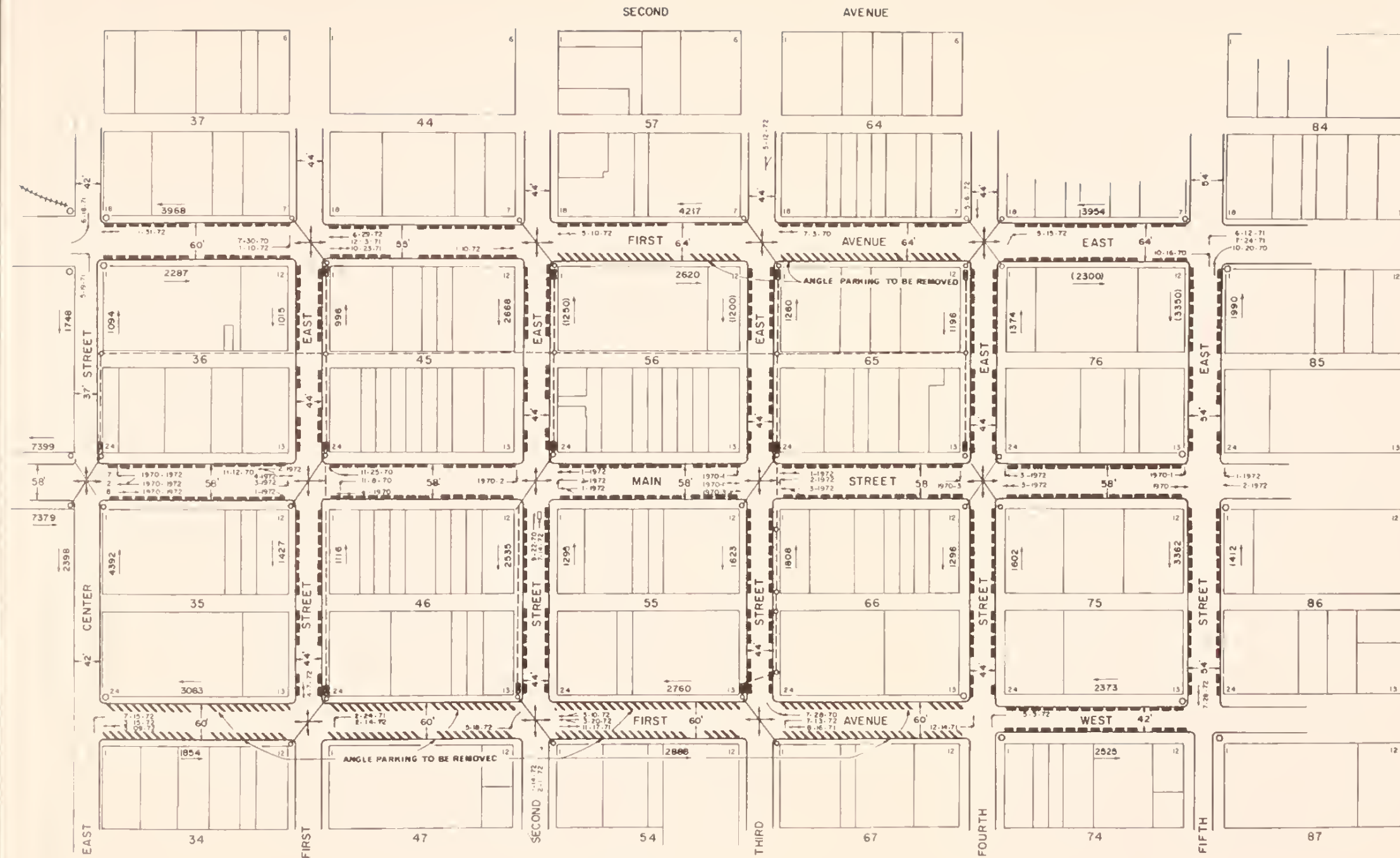
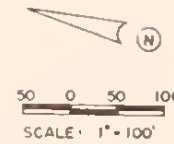
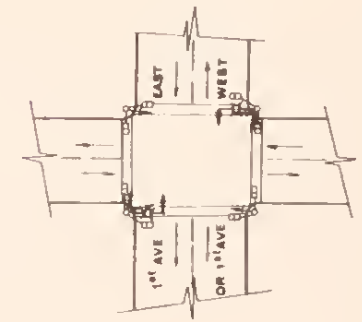
In addition to the generalized criteria discussed above, specific conditions also exist at the various proposed locations which satisfy requirements for signal installations as outlined in the Manual. Warrant No. 1 of the Manual states that intersections within the built-up area of an isolated community having a population of under 10,000 need only have 70% of the minimum volume necessary to justify signal installation. As stated, all of the proposed signal locations lie within the CBD Area and the City of Kalispell does meet the warrant requirement of an isolated community with a population of 10,000. At 7 of the 8 proposed locations, 70% of the minimum vehicular volume, necessary to justify installation under Warrant No. 1, is present. See Volume Warrant Sheets.

The remaining Intersection, 1st Avenue East and 1st Street does not have volumes on the minor street approach which satisfy the 70% volume requirement for the specified 8 hours. The major street approach does satisfy requirements. The minor approach volumes, however, do satisfy the 70% warrant for 2 of the 8 hours with the remaining 6 hours satisfying 55% - 60% of the warrant requirements. However, the signal should still be installed for progression, speed control, and pedestrian safety.

Work To Be Done

- A. Install Traffic Signals incorporating mast arm signal displays on the north-south approaches, post top mount signal displays on the east-west approaches, pedestrian signals, and 2 dial, 3 offset fixed time controllers at the following locations:
 - 1. 1st Avenue East and 1st Street
 - 2. 1st Avenue East and 2nd Street
 - 3. 1st Avenue East and 3rd Street
 - 4. 1st Avenue East and 4th Street
 - 5. 1st Avenue West and 1st Street
 - 6. 1st Avenue West and 2nd Street
 - 7. 1st Avenue West and 3rd Street
 - 8. 1st Avenue West and 4th Street
- B. Where required install interconnect cable to serve the entire CBD and Idaho Street and Main Street Intersection.
- C. Install an emergency pre-emption control unit in fire station capable of controlling a minimum of three separate functions with time-delay.
- D. Remove angle parking from CBD. Meter removal and striping.

PROPOSED TRAFFIC SIGNAL MODIFICATION &
INSTALLATION AT 1ST AVE E & 1ST AVE W
AT 1ST STREET
2ND :
3RD :
4TH :



LEGEND

- | | | | |
|--|----------------------------------|--|------------------|
| | EXISTING TRAFFIC SIGNALS & POLES | | ACCIDENTS |
| | TRAFFIC CONTROLLER | | ANGLE |
| | STOP SIGN | | REAR-END |
| | PARKING | | TURNING MOVEMENT |
| | DIAGONAL | | PARKED VEHICLE |
| | PARALLEL | | SIDESWIPED |
| | ONE WAY | | |
| | 10-72 ADT'S | | |
| | EST ADT'S | | |

EXHIBIT 22

CITY OF KALISPELL CBD

Traffic Inventory and Improvements

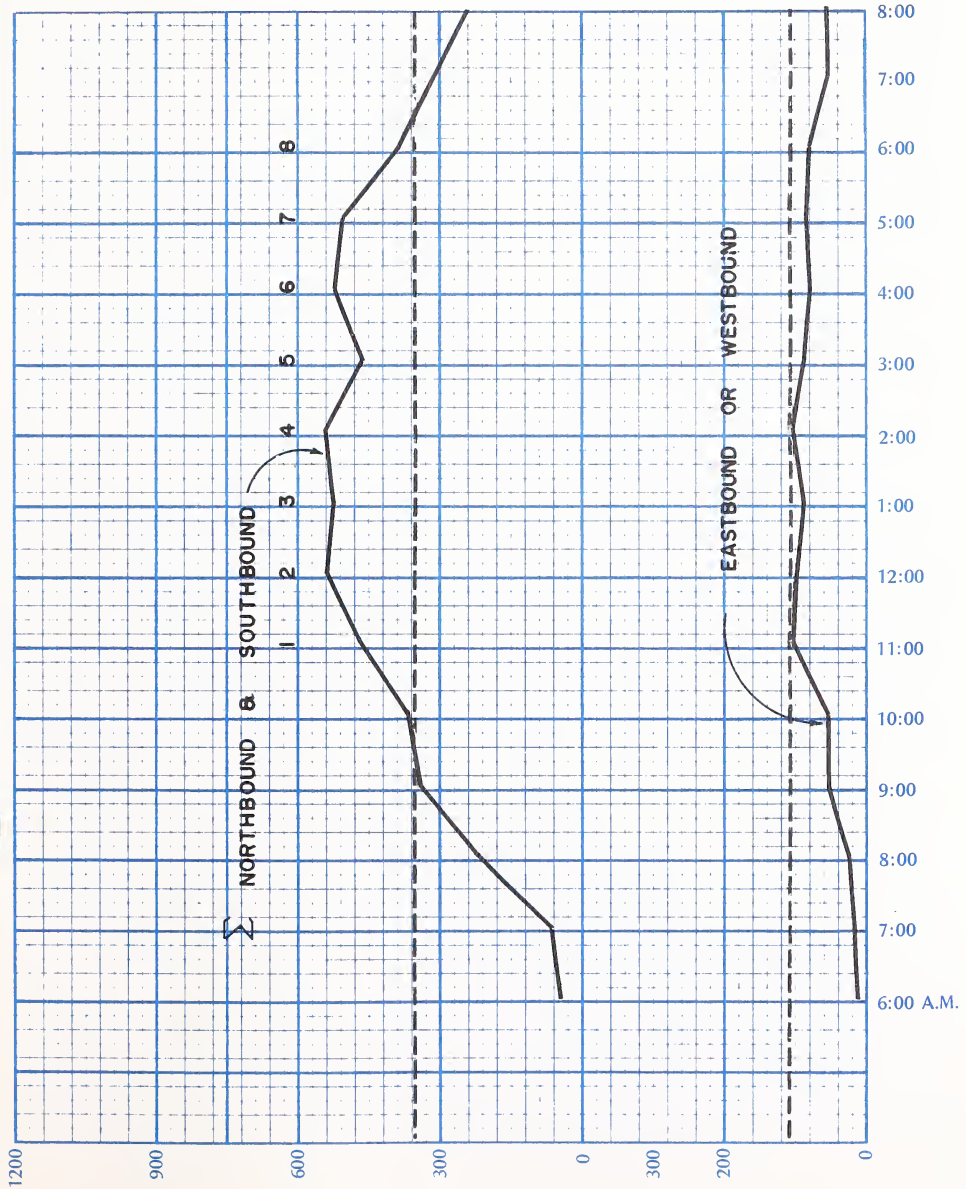
CENTRAL BUSINESS DISTRICT

COST ESTIMATE

Description		Est. Quantity	Unit	Unit Cost	Total Cost	
1.	Install Type 26 Interconnected Controller Complete with Type A Cabinet	1	Ea.	2,000.00	2,000.00	
2.	Traffic Signal Poles incl. Installation, Luminaires and Signals 20' Mast Arm	2	Ea.	2,400.00	4,800.00	
3.	10' Traffic Signal Poles with One Signal Head Installed	2	Ea.	600.00	1,200.00	
4.	Junction Boxes	4	Ea.	65.00	260.00	
5.	Conduit and Wire	250	L.F.	10.00	2,500.00	
6.	Service	1	Ea.	L.S.	200.00	
7.	Pedestrian Signals	8	Ea.	190.00	1,520.00	
8.	Street Striping & Signing	1	Ea.	L.S.	250.00	
9.	Remove & Salvage Existing Traffic Signal	1	Ea.	300.00	300.00	
					13,030.00	
					Contingencies 10%	1,303.00
						14,333.00
					Const. Engr. 10%	1,433.00
					TOTAL Per-intersection	15,766.00
					8 intersections @ \$15,766 per-intersection	126,128.00
1.	Interconnect	4450	L.F.	.75	3,337.00	
2.	Emergency Control Unit	1	L.S.	500.00	500.00	
GRAND TOTAL					\$129,965.00	

Location FIRST AVE. E. & FIRST ST.

TRAFFIC SIGNAL WARRANT



WARRANT
NO. 1 350
VPH MAJOR
ST. FIRST AVE. E.

350 - 70%

WARRANT
NO. 1 105
VPH MINOR
ST. FIRST ST.

105 - 70%

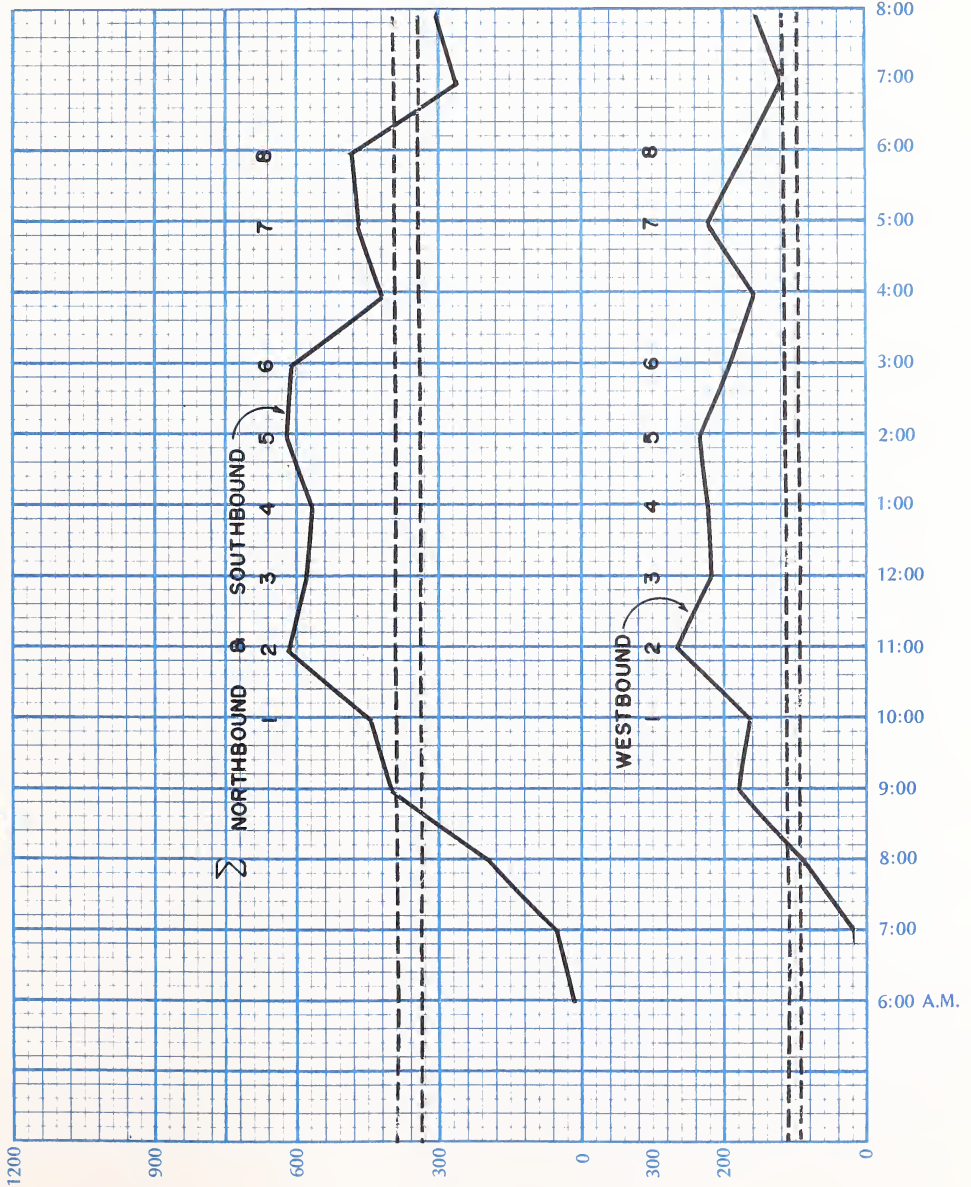
TRAFFIC SIGNAL WARRANT

WARRANT
NO. I 350
VPH MAJOR
ST. FIRST AVE. E.

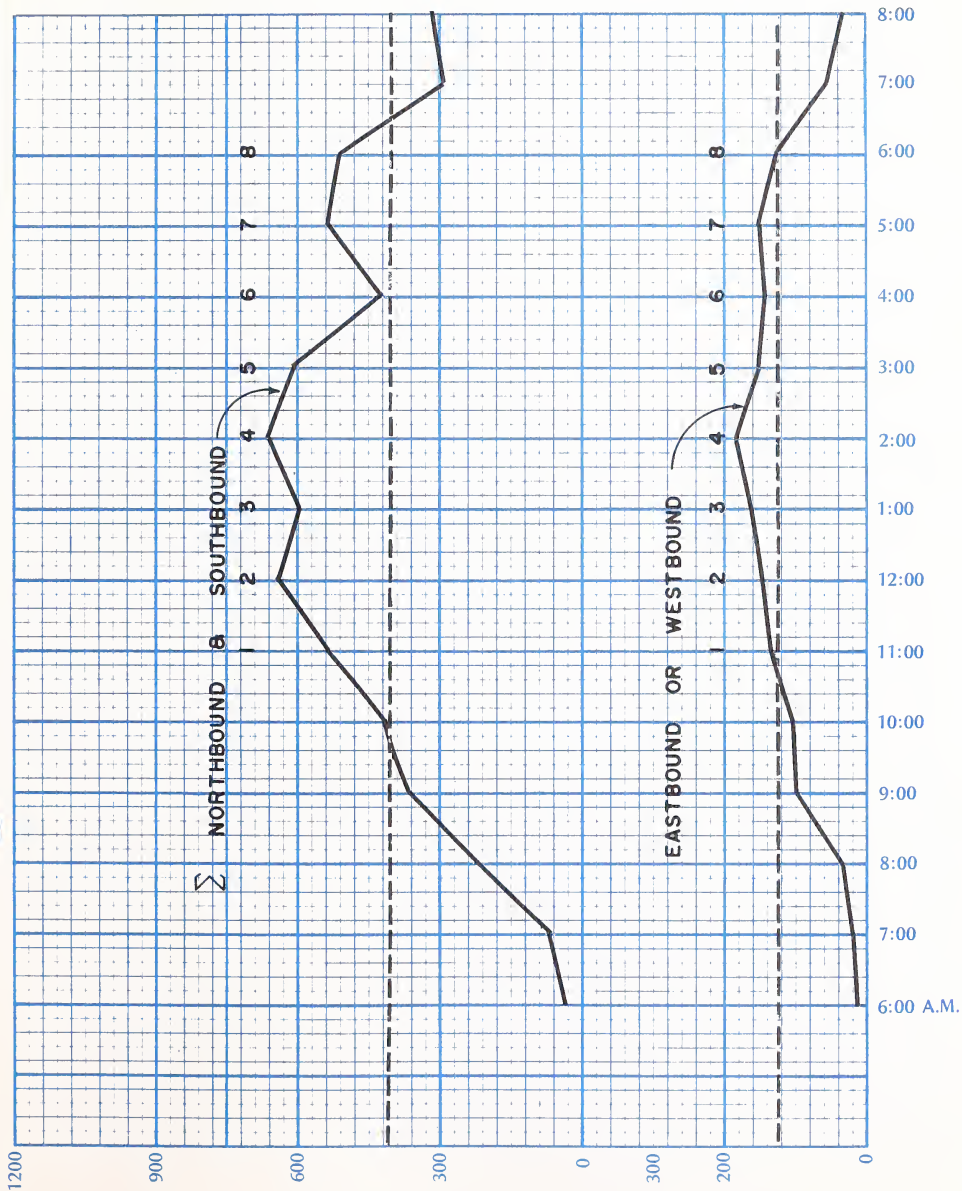
400 - 80 %
350 - 70 %

WARRANT
NO. I 105
VPH MINOR
ST. SECOND ST.

105 - 70 %
120 - 80 %

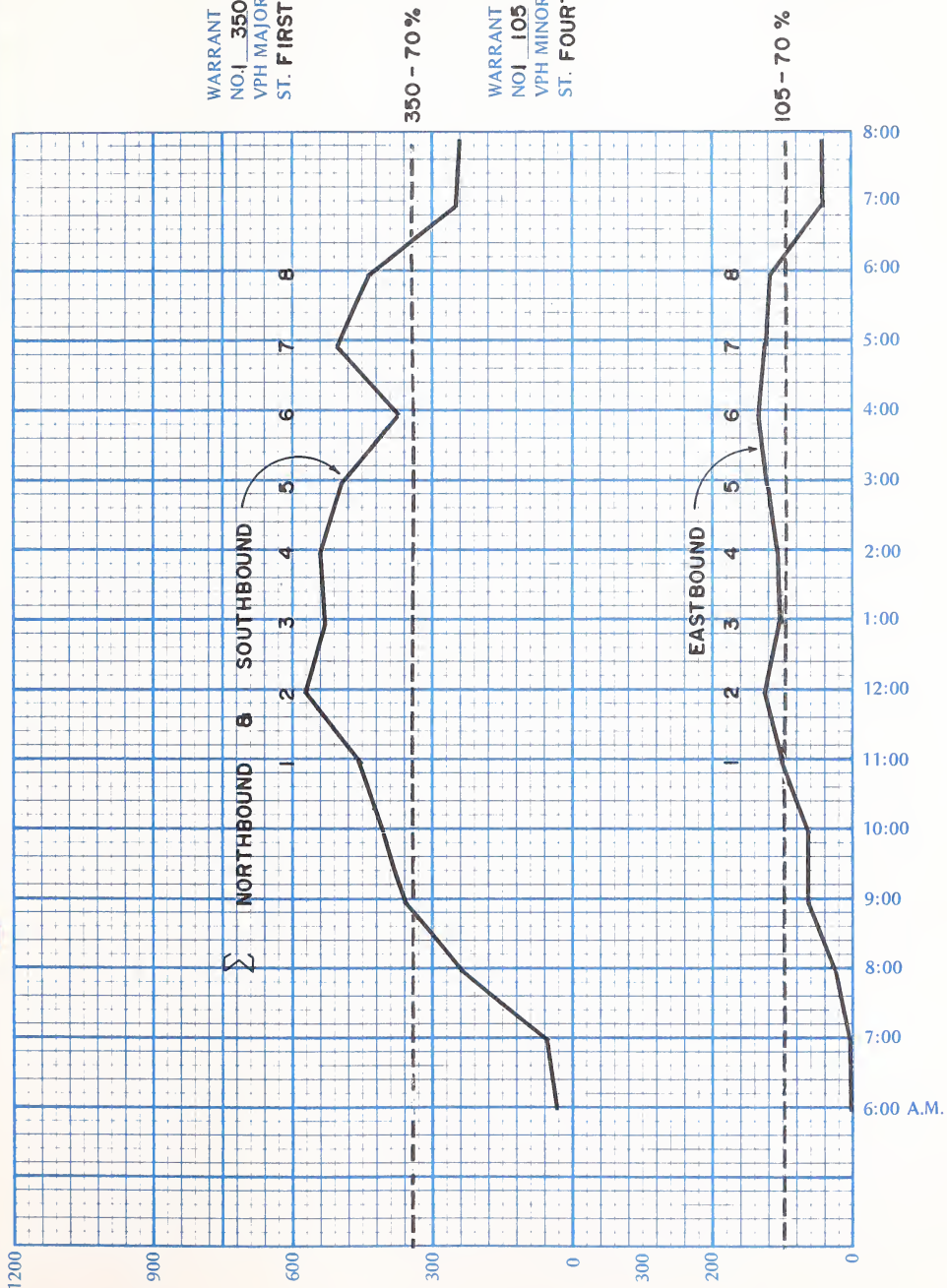


TRAFFIC SIGNAL WARRANT



Location FIRST AVE. E. & FOURTH ST.

TRAFFIC SIGNAL WARRANT



Location **FIRST AVE. W. & FIRST ST.**

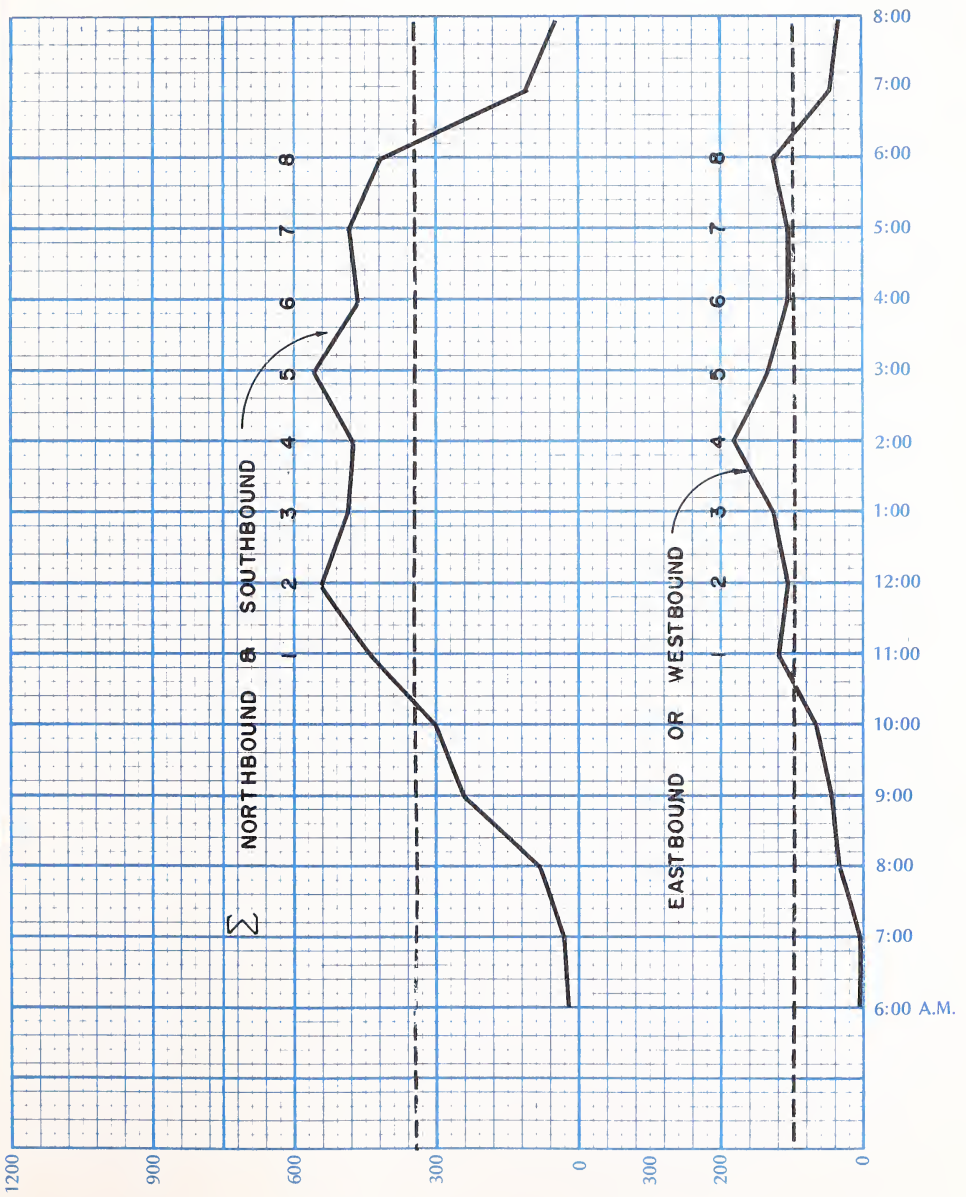
TRAFFIC SIGNAL WARRANT

WARRANT
NO. **I 350**
VPH MAJOR
ST. **FIRST AVE. W.**

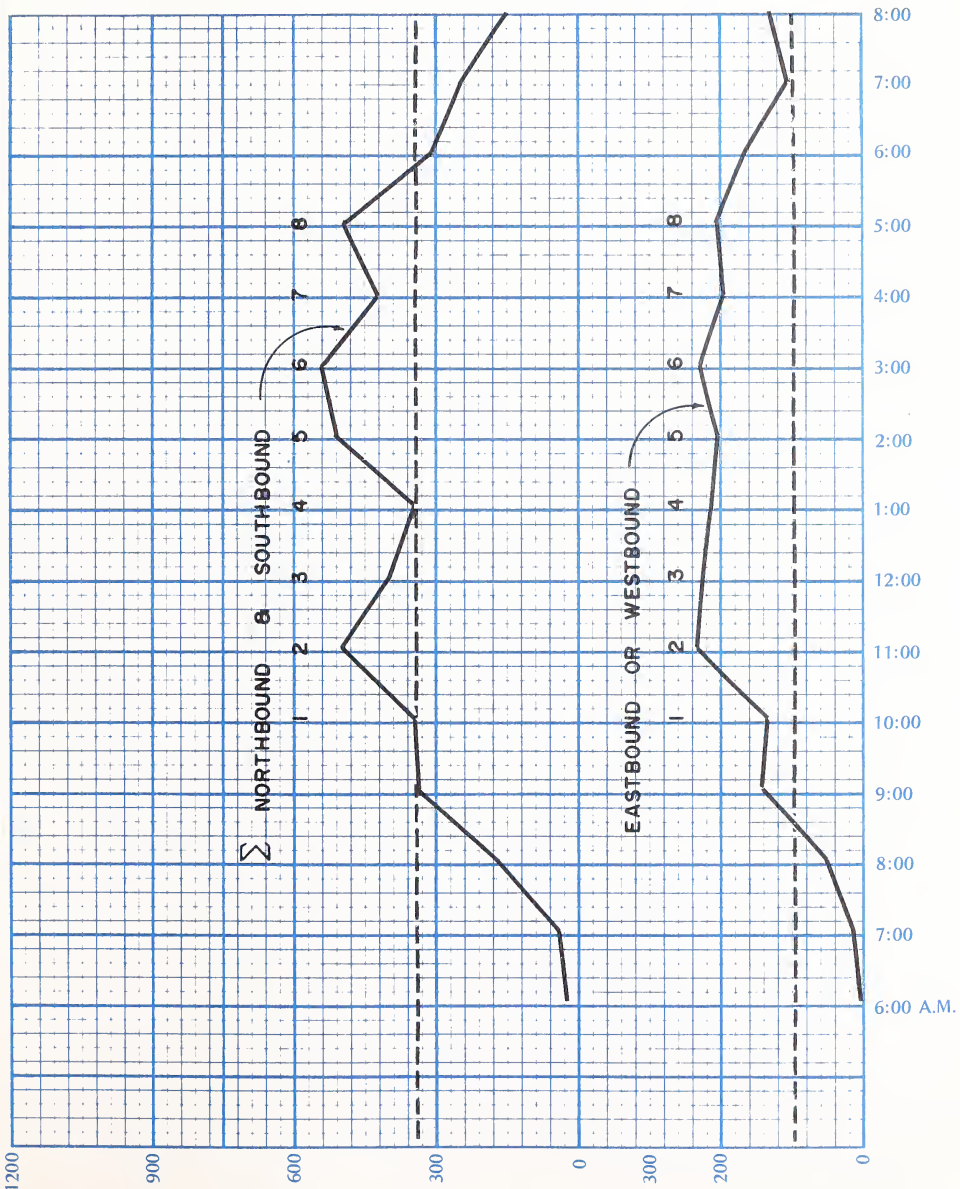
350 - 70 %

WARRANT
NO. **I 105**
VPH MINOR
ST. **FIRST ST.**

105 - 70 %

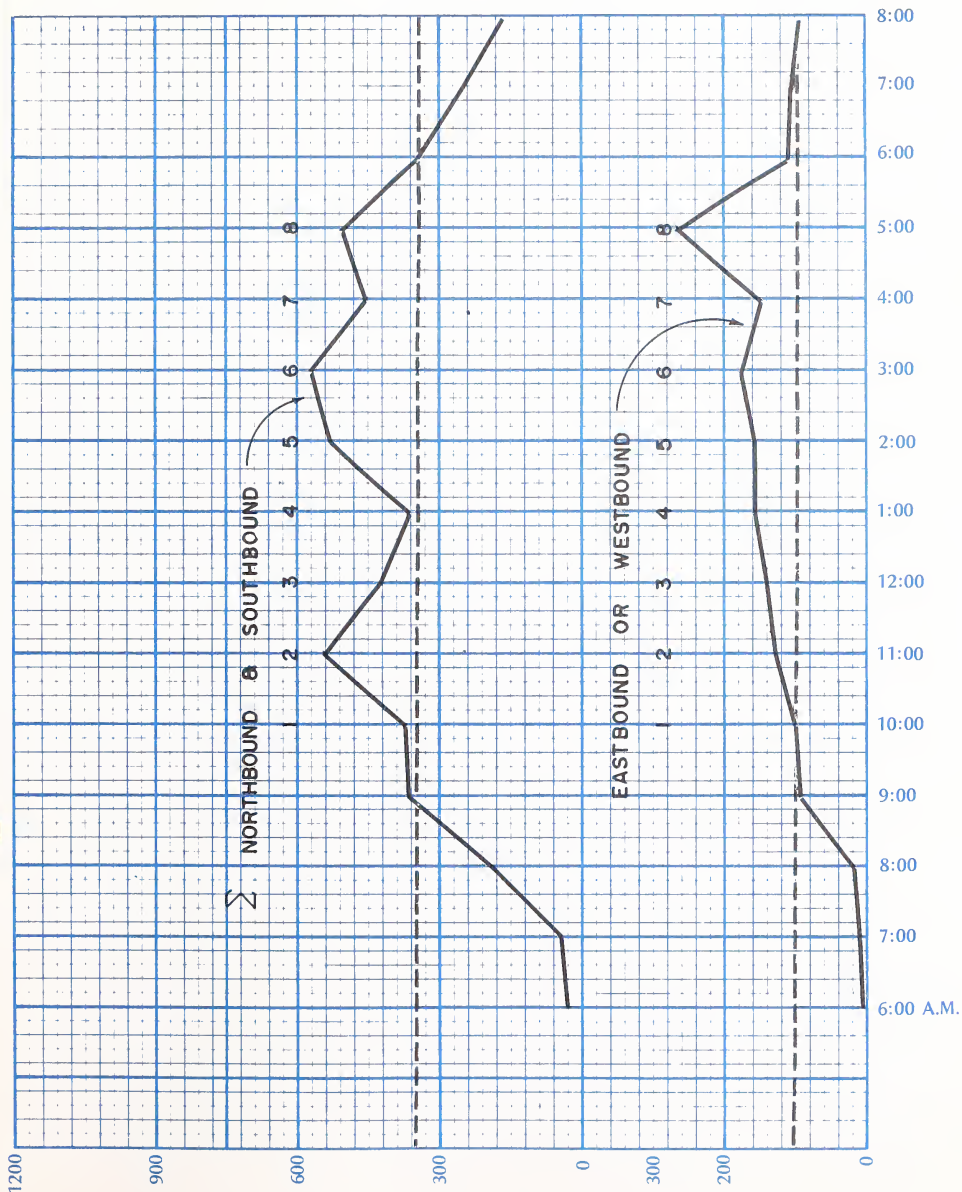


TRAFFIC SIGNAL WARRANT



Location FIRST AVE. W. & THIRD ST.

TRAFFIC SIGNAL WARRANT



WARRANT
NO. 1 350
VPH MAJOR
ST. FIRST AVE. W.

350 - 70 %

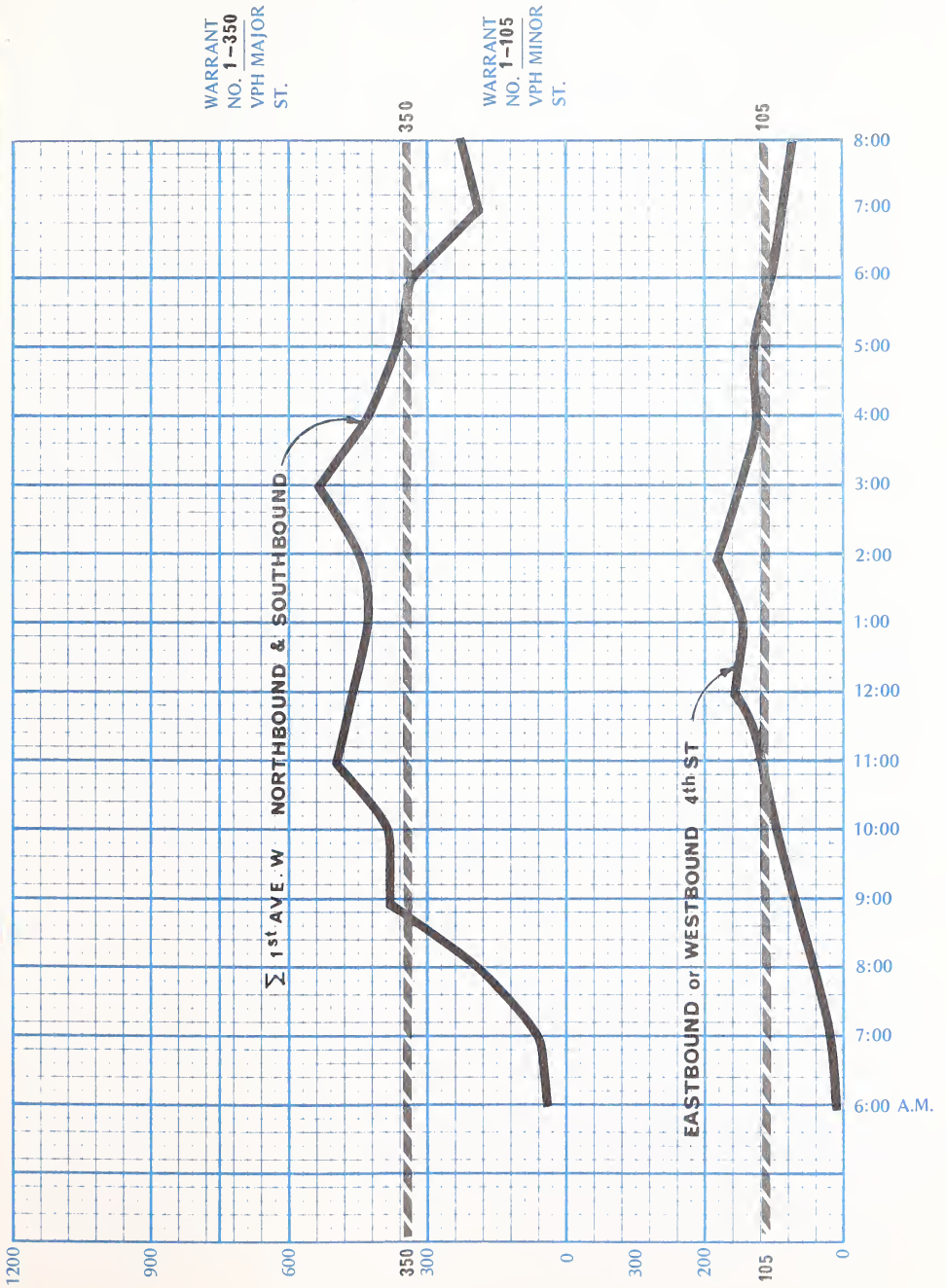
WARRANT
NO. 1 105
VPH MINOR
ST. THIRD ST.

105 - 70 %

Location 1st AVE. W & 4th ST.

KALISPELL

TRAFFIC SIGNAL WARRANT



TOPICS IMPROVEMENT PROJECT

IDAHO STREET (U.S.2) AND MAIN STREET (U.S.93)

Introduction

Idaho Street (U.S.2) is the main east-west highway, and Main Street (U.S.93) is the main north-south route through the City of Kalispell. In 1972 there are approximately 23,000 vehicles per day using the intersection of which 3,000 have an origin and destination outside the Urban Area and the remaining have an origin and/or destination inside the Urban Area. This intersection has more traffic by about 50% to 60% than any other intersection in the City, and is currently the key intersection for internal circulation in the Kalispell Urban Area.

At the present time, the State has let a contract on Project F-RF9999(57)U1 to upgrade this intersection in conformance with the Manual on Uniform Traffic Control Devices (MUTCD) for safety and uniformity reasons only. No major reconstruction of the channelization or a replacement controller is being accomplished.

Justification

The existing volume/capacity (V/C) ratio is 0.80. The critical movements are WB left turn, the NB through, and the EB through. The V/C ratio reduces to 0.66 for the proposed improvement. Field observation confirms the capacity analysis in that for the majority of the day (10AM to 6PM) vehicles in the WB left turn lane are waiting two and sometimes three signal cycles to proceed through the intersection. Of course they backup the inside through lane.

This intersection has the fifth highest accident rate in the City (1.31) and is ranked first for the highest number of accidents (11/year averaged for two years). It can be expected that the current State contract will reduce the number of right angle and rear end collisions, but if the intersection is operating close to capacity, collisions should only diminish slightly because of occasional forced flow conditions with its incumbent amber and red light running.

Since a signal warrant was prepared for Project F-RF9999(57)U1, one is not included with this report. The intersection does meet the MUTCD Warrant No. 1, Minimum Vehicular Volume.

The westbound and eastbound left turns are completely unbalanced by a ratio of 10 to 1. During the rest of the day hours the unbalance varies between 4 to 1 and 12 to 1 for any given cycle. By changing the existing controller to rephase the entire west approach

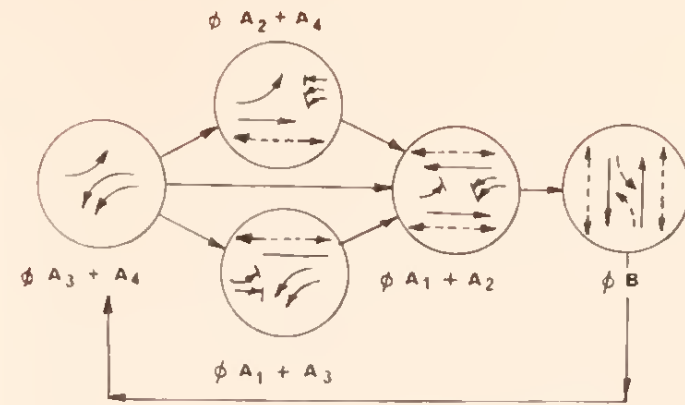
as one phase and the east approach as another phase, the capacity does not improve and it would provide a less efficient operation during light traffic periods.

Consequently, after analyzing the various possibilities utilizing the existing controller and same lane configuration, it is not possible to readily improve the operation of the intersection.

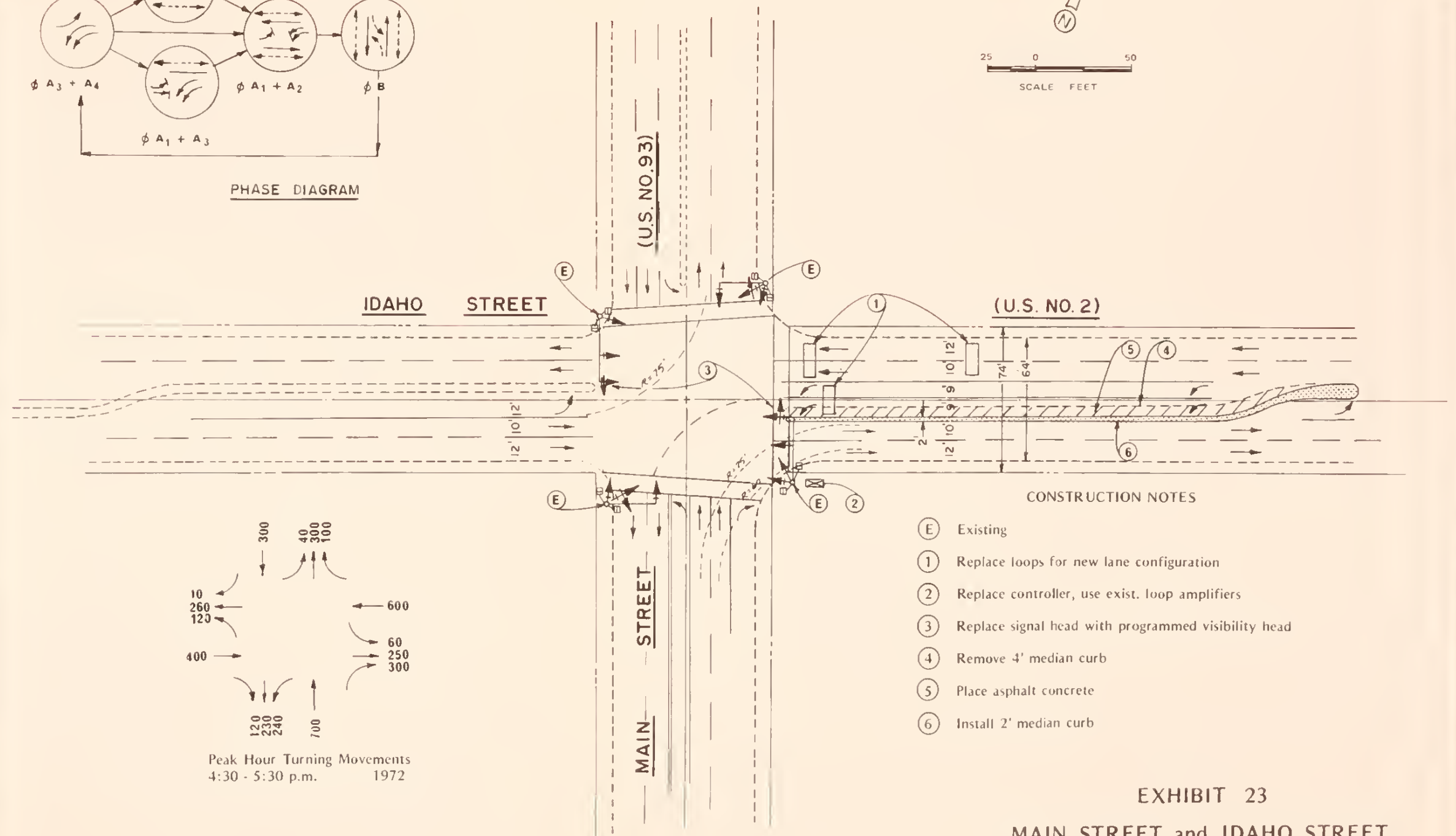
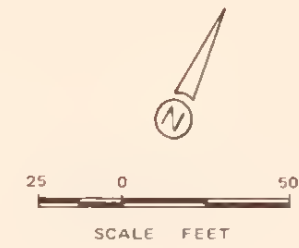
Even though other suggestions have been made throughout the Areawide Plan to alleviate the future generated traffic volumes at this intersection, this project is still necessary to provide for today's traffic volumes by providing a more efficient intersection because of the unbalanced left turn lanes. Conversely, this project does not obviate the necessity for improving the rest of the arterial network as stated in the Areawide Plan.

Work To Be Done

Install new five phase, full-actuated controller and interconnect device. The loop amplifiers, if in good operational order, will be utilized from the old controller. Additional loop amplifiers will be purchased as necessary. Replace loops in the street as necessary for a new lane configuration, and replace the left turn arm signals with optically programmed signal heads. Remove the existing 4' median on the east approach and replace with a 2' median in order to provide a double left turn lane.

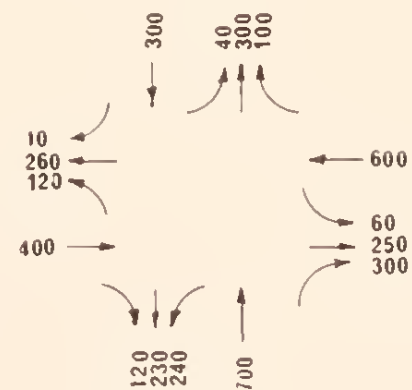


PHASE DIAGRAM



CONSTRUCTION NOTES

- (E) Existing
- (1) Replace loops for new lane configuration
- (2) Replace controller, use exist. loop amplifiers
- (3) Replace signal head with programmed visibility head
- (4) Remove 4' median curb
- (5) Place asphalt concrete
- (6) Install 2' median curb



Peak Hour Turning Movements
4:30 - 5:30 p.m. 1972

EXHIBIT 23
MAIN STREET and IDAHO STREET
Intersection Improvements

IDAHO STREET (U.S. 2) AND MAIN STREET (U.S. 93)

COST ESTIMATE

Description	Est. Quantity	Unit	Unit Cost	Total Cost
1. New 5 Phase Controller	1	L.S.	11,000.00	11,000.00
2. Loop Detectors	3	Ea.	300.00	900.00
3. Programmed Visibility Heads	2	Ea.	600.00	1,200.00
4. Removal 4' Median Island	280	L.F.	2.00	560.00
5. Street Construction	133	S.Y.	5.00	665.00
6. 2' Median Curb	280	L.F.	3.50	980.00
7. Median Curb Conc.	5	C.Y.	75.00	375.00
8. Paint Removal & Restriping Lane Lines and Arrows	1	L.S.	300.00	300.00
Subtotal				15,980.00
Contingencies 10%				1,598.00
				17,578.00
Const. Engr. 10%				1,758.00
Grand Total				\$19,336.00

COLLISION DIAGRAM

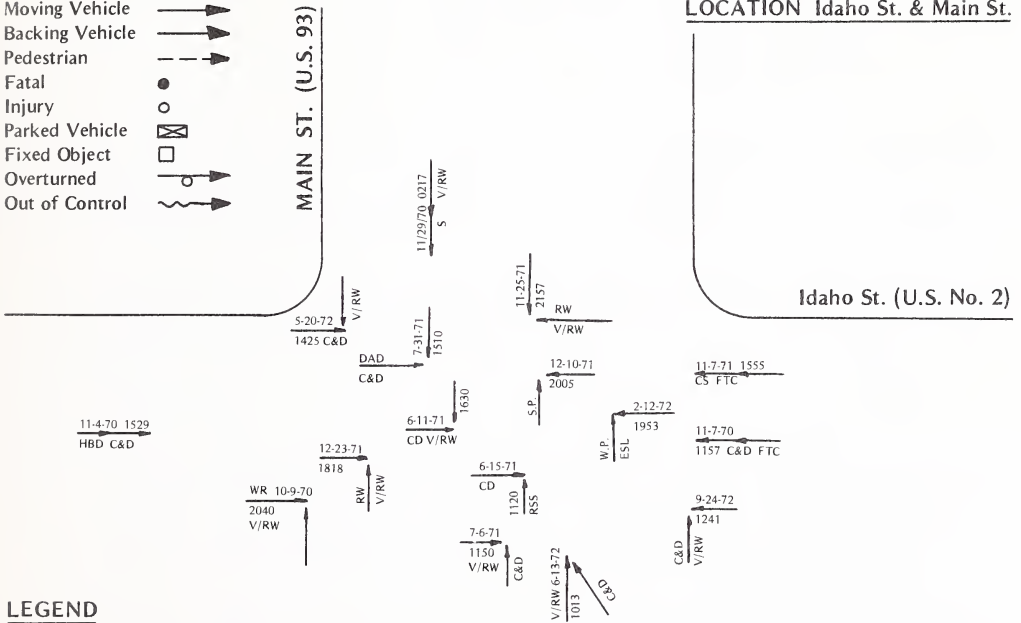
CITY OF KALISPELL

JULY 1970 to JUNE 1972

LEGEND - SYMBOLS

Moving Vehicle →
 Backing Vehicle →
 Pedestrian →
 Fatal ●
 Injury ○
 Parked Vehicle ☒
 Fixed Object □
 Overturned ○
 Out of Control ~→

LOCATION Idaho St. & Main St.



LEGEND

Time ____ A=A.M. P=P.M.
 Pavement - D=Dry W=Wet I=Icy
 Weather - C=Clear F=Fog
 R=Rain SL=Sleet
 S=Snow

PROBABLE CAUSE

Exceeding Safe speed (ESS)
 Exceeding Speed limit (ESL)
 Ran Stop sign (RSS)
 Ran Signal (RS)
 Stopped, then proceeded (S&P)
 Following too close (FTC)
 Wrong side of road (WSR)
 Violated right of way (V/RW)
 Had been drinking (HBD)
 Did not see traffic (NSTC)
 Control Device
 Driving attention diverted (DAD)
 Mechanical Failure (MF)

ACCIDENT SUMMARY

TYPE	DAY			NIGHT			TOTAL		
	Fatal	Inj.	P.D.	Fatal	Inj.	P.D.	Fatal	Inj.	P.D.
Right Angle		2	5		1	3		3	8
Rear End		1	4			1		1	5
Left Turn						1			1
Sideswipe		1	1			1		1	2
Pedestrian									
Other			1						1

TOPICS IMPROVEMENT PROJECT

CENTER STREET WIDENING

Introduction

Center Street is the Northern Terminus of the Central Business District. The adjacent land uses between 4th Avenue East and Meridian Road are predominantly commercial-industrial. Consequently, truck movements occupy a greater percent of the AADT than any other street in the City.

The project location lies between Main Street and 1st Avenue East. This particular segment serves traffic destined for the Central Business District, the light industrial area, and the residential area to the east of the CBD.

Justification

At the Intersection of Main Street and Center Street the volume/capacity (V/C) ratio is 1.30 based upon the existing characteristics. The critical movements are the SB and WB through and the EB left turn. The State's current Project (F-RF9999(57)U1) should reduce the V/C to 0.90±. If Center Street is widened, the V/C is reduced to 0.84 with the SB through and the EB left turn being critical.

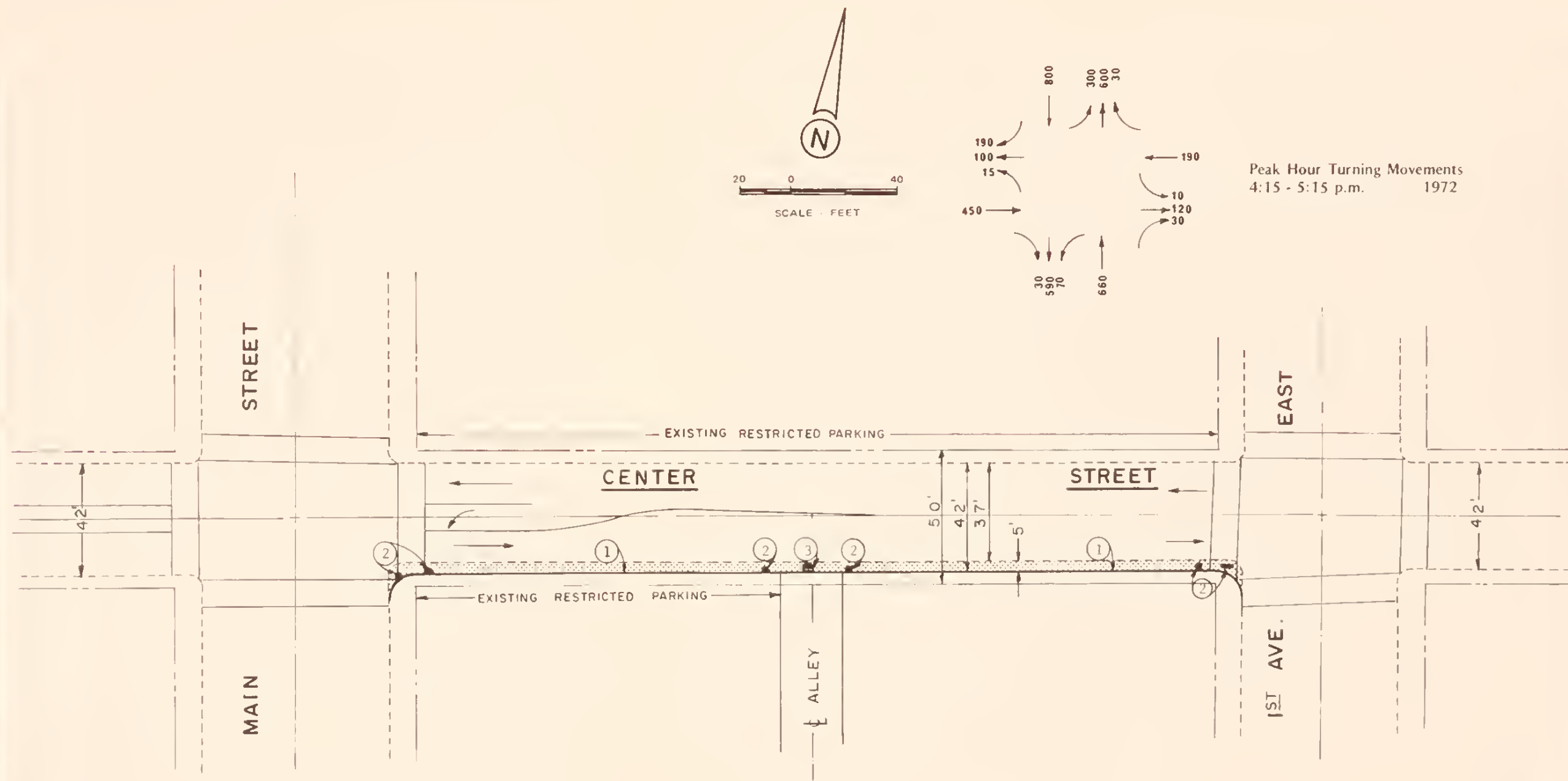
Center Street is 42' wide to the west of Main Street and 42' wide to the east of 1st Avenue East.

The Intersection of Center St. with Main Street has the ninth highest accident rate in the City (1.16) and is ranked second for the highest number of accidents (8.5/year averaged for two years).

Due to trucks and the restricted approach width, turning movements delay the through movement as well as create a hazard.

Work To Be Done

Widen Center Street from 37' to 42' by removing 5' of sidewalk and constructing curb and gutter and the roadway. Relocate one traffic signal pole, the signal controller, four power poles, one catch basin, and one fire hydrant.



CONSTRUCTION NOTES

- 1 Construct new street improvements including curb, gutter, sidewalk.
- 2 Relocation of existing power poles, fire hydrant and traffic signal poles.
- 3 Relocate existing catch basin.

EXHIBIT 24
CENTER STREET IMPROVEMENTS
Main Street to 1st Avenue E

CENTER STREET
COST ESTIMATE

Description	Est. Quantity	Unit	Unit Cost	Total Cost
1. Street Excavation	60	C.Y.	5.00	300.00
2. Street Construction	180	S.Y.	6.00	1,080.00
3. Curb and Gutter	362	L.F.	7.00	2,534.00
4. Traffic Apparatus Relocation	1	Ea.	L.S.	800.00
5. Power Pole Relocation	4	Ea.	300.00	1,200.00
6. Catch Basin Relocation	1	Ea.	300.00	300.00
7. Fire Hydrant Relocation	1	Ea.	200.00	200.00
Subtotal				6,414.00
Contingencies 10%				641.00
				7,055.00
Const. Engr. 10%				705.00
Total				\$7,760.00

TOPICS IMPROVEMENT PROJECT

IDAHO STREET (U.S.2) AND LASALLE RD. (FAS206)

Introduction

Idaho Street (U.S.2) is the main east-west highway through the City of Kalispell and LaSalle Rd. (FAS206) is a secondary north-south route between Kalispell and Columbia Falls, Glacier National Park, and the Glacier Park International Airport. U.S.2 is the primary highway to Columbia Falls and Glacier National Park.

The 1972 volume counts indicate that the EB left turn to NB and the SB right turn to WB are the predominant movements compared to the through movement on U.S.2. The aluminum plant is the prime generator that accounts for the heavy volumes on the north leg as compared to the east leg.

The existing regulatory traffic control devices controlling the intersection consist of a "STOP" Sign stopping LaSalle Road, a 3-way flasher, a "RIGHT LANE MUST TURN RIGHT" Sign approximately 300 feet from the intersection and a "STOP AHEAD" Sign approximately 600 feet in advance of the intersection, which appears to be lost in the background. For the predominant right turn movement the turning radius is approximately 275 feet.

U.S.2 and LaSalle Rd. are four lane roadways through this intersection. U.S.2 transitions from a four lane to a two lane roadway approximately 650' east of the intersection.

Justification

This intersection has the fourth highest accident rate in the City (1.43) and is ranked fifth for the highest number of accidents (5.5/year averaged for two years). According to National Norms an accident rate of 0.75 would be considered normal for this type of three way intersection with these road geometrics and flow conditions. Of the 11 accidents, 9 have involved cars in the right turn lane, 8 rear ends and one sideswipe. Four of the rear ends occurred in 1970 and four in 1971.

Accident Analysis

Upon reviewing the officer's accident reports, the following can be derived:

- 1) None of the accidents were blamed on wet or icy road conditions.
- 2) None of the involved drivers had been drinking.
- 3) Four of the rear end accidents were caused by drivers not observing the STOP Sign.

- 4) The other four rear end accidents were caused after both vehicles had come to a stop, i.e., the first vehicle started into the intersection, hesitated, and stopped for a second time; the second vehicle failed to stop the second time thinking vehicle No. 1 was proceeding into the intersection.
- 5) Only one rear end caused injuries, which were not serious to the occupants of the vehicles.

One of the major problems at this intersection appears to be that the major leg is stopped.

Proposed Solution

Since the accident data indicates that there are two separate problems, several possibilities were investigated involving regulatory and warning devices.

However, since none of the other, less costly solutions seemed to solve the problem, we recommend rechannelization of the intersection in order to provide a protected free right turn lane for the predominant movement, as shown on the improvement drawing Exhibit 22.

Work To Be Done

- 1) Install appropriate warning and regulatory signs on the east approach to provide one through lane and one right turn in place of the two through lanes.
- 2) Construct new island separating the right turn movement from the through movement in the northeast quadrant of the intersection.
- 3) Extend the existing island across the right through lane in the northwest quadrant of the intersection in order to shadow or protect the right turning vehicle from LaSalle Road.
- 4) Replace 8" sections with 12" programmed visibility head on the red lens indication for LaSalle Road.
- 5) Remove and install appropriate warning and regulatory signs on LaSalle Rd.

- CONSTRUCTION NOTES
- ① Construct Type B curb median
 - ② Construct a.c. concrete median
 - ③ Relocate existing stop ahead sign and stop sign
 - ④ Existing right lane must turn right sign to remain in place
 - ⑤ Install Keep right sign R4-7b
 - ⑥ Install Free right turn sign
 - ⑦ Install Only sign R3-5
 - ⑧ Install right turn must turn right R3-7
 - ⑨ Modify existing 3-way flasher
 - ⑩ Remove exist. striping
 - ⑪ Remove exist. stop signs

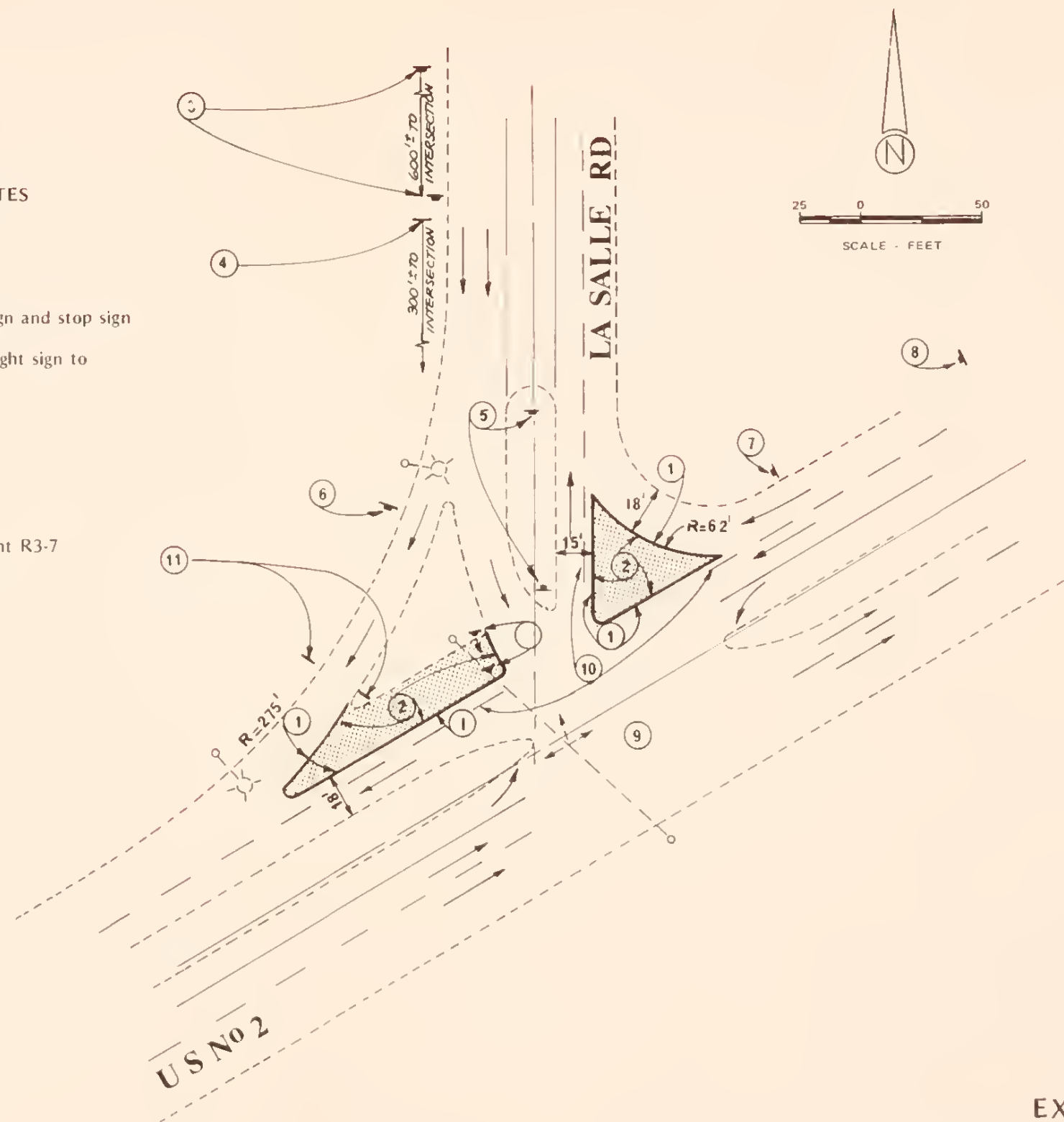


EXHIBIT 25
INTERSECTION IMPROVEMENTS
U.S. 2 and LaSalle Road

U.S. NO. 2 AND LASALLE RD.

COST ESTIMATE

Description	Est. Quantity	Unit	Unit Cost	Total Cost
1. Construct Median	355	L.F.	3.00	1,065.00
2. A.C. Conc. Median	137	Tons	20.00	2,740.00
3. Relocate and/or Remove Signs	4	Ea.	20.00	80.00
4. Install Signs	5	Ea.	60.00	300.00
5. Modify Existing 3-way Flasher	1	L.S.	300.00	300.00
				4,485.00
		Contingencies 10%		448.00
				4,933.00
		Const. Engr. 10%		493.00
				\$5,426.00

COLLISION DIAGRAM

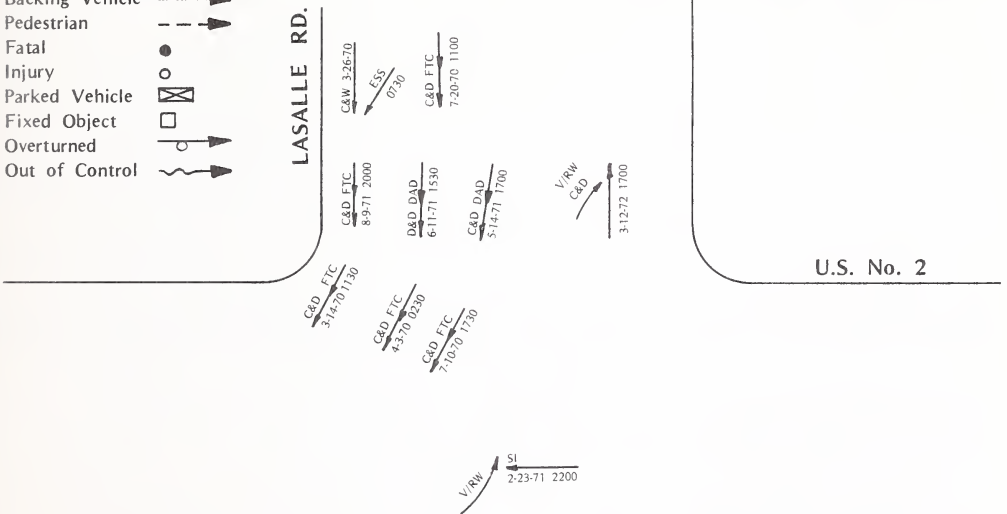
CITY OF KALISPELL

MAR 1970 to AUG 1971

LEGEND - SYMBOLS

Moving Vehicle →
 Backing Vehicle →
 Pedestrian →
 Fatal ●
 Injury ○
 Parked Vehicle ☒
 Fixed Object □
 Overturned ○
 Out of Control →

LOCATION U.S. No. 2 & LaSalle Rd.



LEGEND

Time ____ A=A.M. P=P.M.
 Pavement - D=Dry W=Wet I-Icy
 Weather - C=Clear F=Fog
 R=Rain SL=Sleet
 S=Snow

PROBABLE CAUSE

Exceeding Safe speed (ESS)
 Exceeding Speed limit (ESL)
 Ran Stop sign (RSS)
 Ran Signal (RS)
 Stopped, then proceeded (S&P)
 Following too close (FTC)
 Wrong side of road (WSR)
 Violated right of way (V/RW)
 Had been drinking (HBD)
 Did not see traffic (NSTC)
 Control Device
 Driving attention diverted (DAD)
 Mechanical Failure (MF)

ACCIDENT SUMMARY

TYPE	DAY			NIGHT			TOTAL		
	Fatal	Inj.	P.D.	Fatal	Inj.	P.D.	Fatal	Inj.	P.D.
Right Angle									
Rear End									
Left Turn									
Sideswipe									
Pedestrian									
Other									

TOPICS IMPROVEMENT PROJECT

U.S. 93 ACCESS (S. MAIN STREET) AND FRONTAGE ROAD

Introduction

U.S. 93 (S. Main Street) is the main north-south route through the City of Kalispell. The Frontage Road is old U.S. 93 and intersects with U.S. 93 at acute angles at both the northern and southern end.

U.S. 93 is 36' wide, including two - 6' shoulders. Driveway access is controlled by guardrail sections.

Since both the Frontage Road and U.S. 93 change from a north-south alignment at 13th Street to a northwesterly-southeasterly direction, skewed angle and multi-leg intersections occur.

Ultimately, the land use should change from vacant to a highway oriented commercial use.

Justification

At the present time, U.S. 93 has several points of access for left turning cars south of 13th Street causing delays to the through traffic.

Both of the Frontage Road - U.S. 93 Intersections are wide, long intersections creating a large conflict area and multiple points of access to and from the same street. In addition, the northern intersection is a 5 legged intersection.

The 1st Avenue East - Frontage Road Intersection is a 3 legged skewed intersection with a fire hydrant in the middle.

The 3rd Avenue East (Type II Street) - Frontage Road Intersection is a 5 legged skewed intersection and with no curb creates an intersection approximately 300' long by utilizing a private parking lot.

According to the accident records the accident rate is minimal, which could be due to "chance" alone or the fact that drivers recognize the accident hazard and drive with extreme caution.

Traffic Engineering practice dictates that intersection design should incorporate the following principles: avoidance of multiple merging maneuvers; separation and reduction

of areas of conflict; and segregation of nonhomogeneous flows. All of these points are violated as the system is now operating.

Secondly, it would be desirable in the future as traffic volume grows to deny driveway access on U.S. 93, at least on the easterly side. By constructing the proper end conditions and the other intersections at this time on the Frontage Road, the street could function as a frontage road with driveway access to all types of commercial development and U.S. 93 would ultimately have only two points of access on the east side of Frontage Road.

Work To Be Done

- 1) Reconstruct the Intersection of 13th Street, Airport Road, and U.S. 93 by aligning 13th Street with Airport Road and providing a left turn lane on U.S. 93. Some striping modification will be required to the proposed State work at Airport Road and U.S. 93.

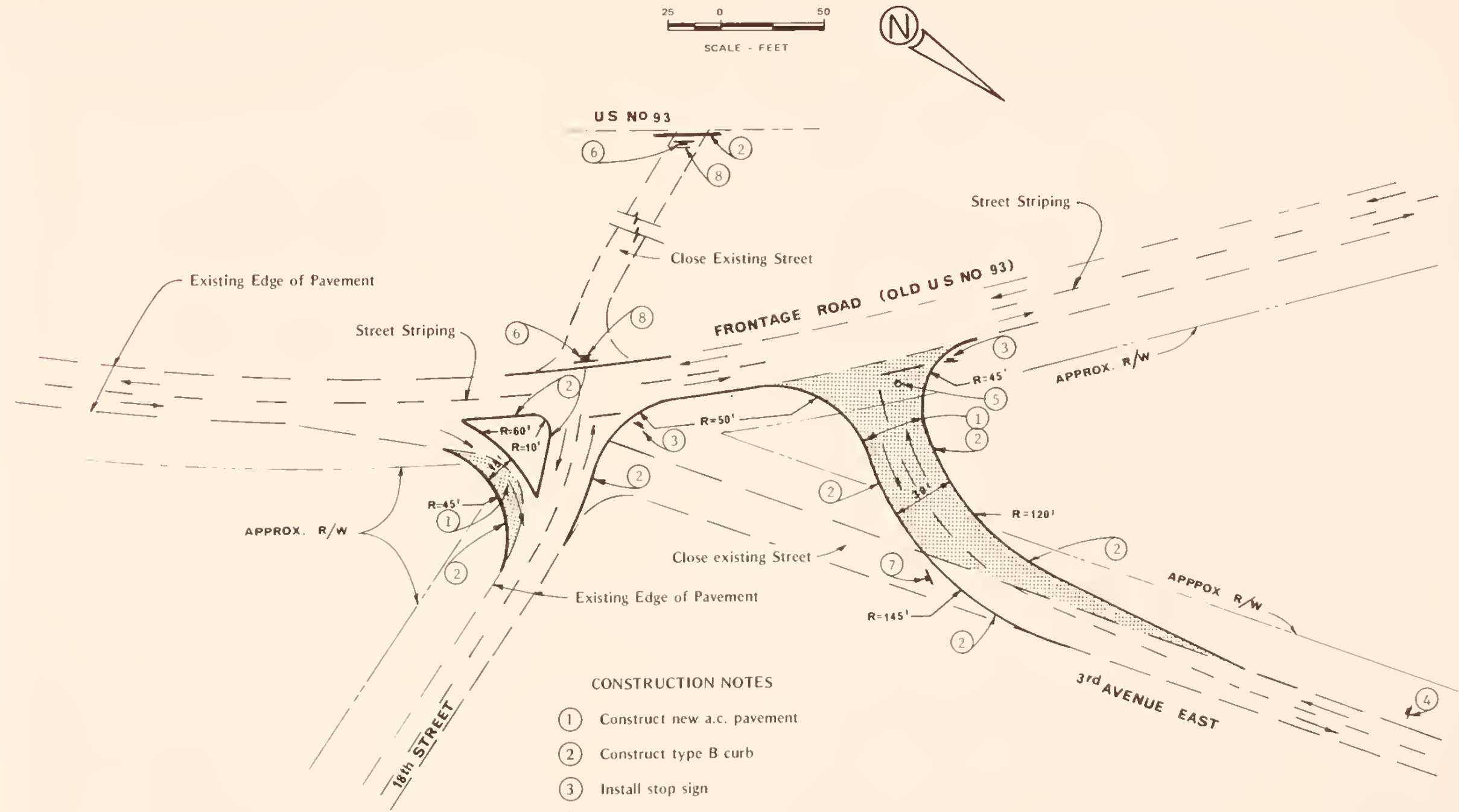
Reconstruct the Intersection of U.S. 93, Frontage Road, and 1st Avenue East by aligning the Frontage Road with U.S. 93 to form a right angle, aligning 1st Avenue East with the Frontage Road to form a right angle, and by providing a left turn lane on U.S. 93.

- 2) Reconstruct the intersection of 3rd Avenue East, 18th Street, and Frontage Road by aligning 3rd Avenue East with the Frontage Road, by closing 18th Street between the Frontage Road and U.S. 93, and by installing curb to reduce the conflict area created by the presence of the parking lot.
- 3) Reconstruct the Intersection of the Frontage Road and U.S. 93 by aligning the Frontage Road with U.S. 93 at right angles.

An undetermined amount of right of way would be necessary to construct the above projects. Based upon our preliminary analysis of the limits of the existing right-of-way, some research of the deeds would be required. For this reason right-of-way was not included in the cost estimates.



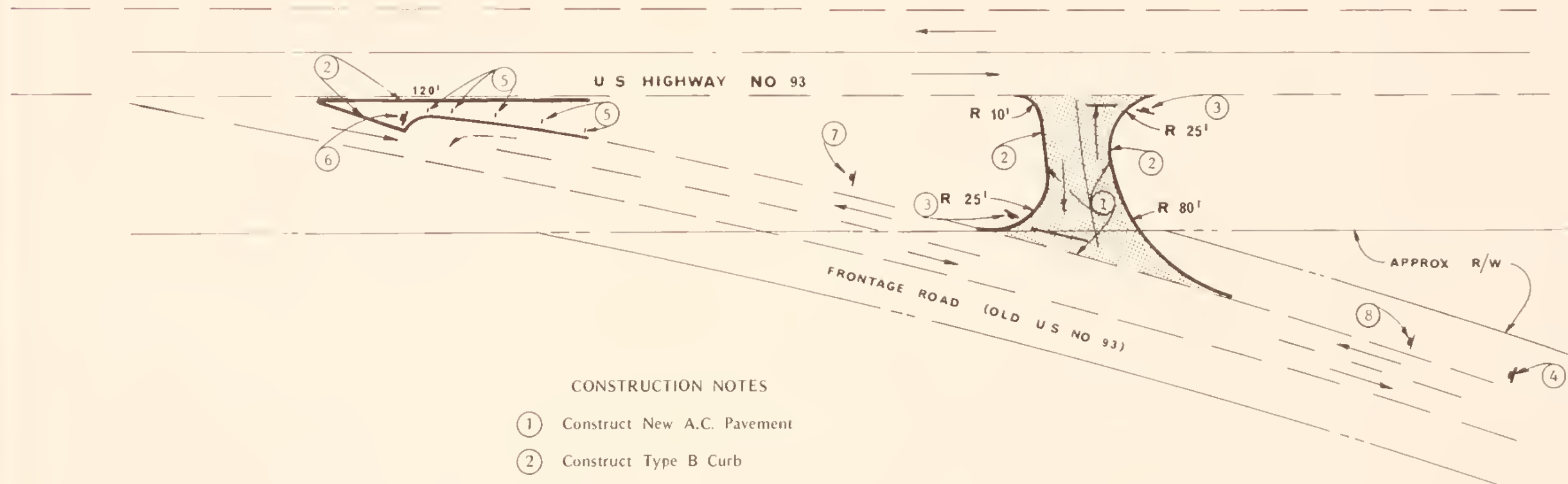
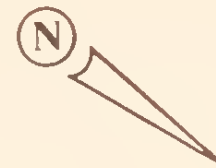
EXHIBIT 26
ACCESS AERIAL PLAN



CONSTRUCTION NOTES

- ① Construct new a.c. pavement
- ② Construct type B curb
- ③ Install stop sign
- ④ Install stop ahead sign
- ⑤ Relocate existing utility poles
- ⑥ Install W1-7
- ⑦ Install W1-6
- ⑧ Install Marker X3-2

EXHIBIT 28
 INTERSECTION IMPROVEMENTS
 3rd Avenue East at 18th Street and Frontage Road



CONSTRUCTION NOTES

- ① Construct New A.C. Pavement
- ② Construct Type B Curb
- ③ Install Stop Sign
- ④ Install Stop Ahead Sign
- ⑤ Install Delineators
- ⑥ Install Do Not Enter Sign R5-1
- ⑦ Install Dead End Sign W14-1
- ⑧ Install To U.S. 93 Sign

EXHIBIT 29
INTERSECTION IMPROVEMENTS
U.S. 93 and Frontage Road

1ST AVENUE EAST - FRONTAGE RD. AND U.S. 93

COST ESTIMATE

Description		Est. Quantity	Unit	Unit Cost	Total Cost
1.	Constr. 3" A.C. Overlay Pavement	750	S.Y.	3.00	2,250.00
2.	Constr. Type B Curb	130	L.F.	3.00	390.00
3.	Signing	5	Ea.	60.00	300.00
4.	Street Striping	1	L.S.	2,000.00	2,000.00
5.	Relocate Guardrail	90	L.F.	3.00	270.00
6.	Constr. New Drive Approach	180	S.Y.	6.00	1,080.00
Subtotal					6,290.00
Contingencies 10%					629.00
					6,919.00
Const. Engr. 10%					692.00
GRAND TOTAL					\$7,611.00

3RD AVENUE AND 18TH STREET AND FRONTAGE RD.

COST ESTIMATE

Description	Est. Quantity	Unit	Unit Cost	Total Cost
1. Constr. New A.C. Pavement	600	S.Y.	6.00	3,600.00
2. Constr. Type "B" Curb	750	L.F.	3.00	2,250.00
3. Signing	7	Ea.	60.00	420.00
4. Relocate Utility Pole	1	Ea.	500.00	500.00
5. Street Striping	1	L.S.	300.00	300.00
		Subtotal		7,070.00
		Contingencies 10%		707.00
				7,777.00
		Const. Engr. 10%		778.00
		Grand Total		\$8,555.00

U.S. NO. 93 AND FRONTAGE ROAD

COST ESTIMATE

Description	Est. Quantity	Unit	Unit Cost	Total Cost
1. Const. New A.C. Pavement	310	S.Y.	6.00	1,860.00
2. Const. Type B Curb	455	L.F.	3.00	1,365.00
3. Signing	10	Ea.	40.00	400.00
4. Street Striping	1	L.S.	200.00	200.00
Subtotal				3,825.00
Contingencies 10%				383.00
				4,208.00
Const. Engr. 10%				421.00
Grand Total				\$4,629.00

